Kaupang Excavation Project
Publication Series, Volume 2
Norske Oldfunn XXIII

MEANS OF EXCHANGE

EDITED BY DAGFINN SKRE

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Dealing with Silver in the Viking Age

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Introduction 1

DAGFINN SKRE

The first element in the place-name Kaupang is *kaup*, the Old Norse word for 'a deal' or 'trade'. As that word is incorporated into the name of the town, it is evident that striking deals and trading were central activities there, perhaps the dominant ones. But what sort of trade was it that was so characteristic of this town? Was it trade in exotic goods over the gunwales of Frisian merchant ships, or maybe in the houses of permanently settled traders? Was it the sale of foodstuffs, fuel and other necessities to the inhabitants of the town? Or was it trade in the jewellery, glass beads, weapons or tools which were produced by the various craftsmen in the town? And what did people pay with in a town which did not mint its own coins? Was payment made using foreign coin, or fragmented and weighed silver, or did people perhaps make payment in kind, at rates of exchange determined by tradition, as was common in Norway in the period 1000–1500? These questions, and others concerning Viking-period trade, are discussed in the present volume.

Archaeology's ability to identify the places of production and deposition of objects draws attention naturally to the movement of such objects through space. In archaeological research into the Viking Period, when the movement of goods rose to a higher level than in any earlier time, the natural consequence is that trade has been attributed major significance amongst the explanations of material diffusion. This is thus one of the classic subjects for archaeological research of the Viking Period.

In this book, however, the starting point for the investigation of the phenomenon of trade is not the goods that were traded. Studied here are the most important items that were used when payments in silver were made (Chs. 3–6). In the final chapters in the book (Chs. 7–10), this material is discussed in the context of certain general questions and theoretical issues. These are outlined in what follows.

1.1 Rethinking the substantivist approach

By focusing on the items used to make payment, and by making trade the subject of this book, the editor is not overlooking the significance of other forms of exchange of goods, such as the payment of tribute, theft, and gift exchange. Likewise, as subsequent volumes in this series will show in full, there is no presumption that the exchange of goods is more important than their production (see Skre 2007b:16–18). The approach is rather a reflection of a new tendency in archaeological and historical research, namely the dissolution of the dichotomy that has dominated the perception of economy and the exchange of goods since the 1970s. In the tradition following Polanyi (1944, 1957, 1963, 1968) a choice has had to be made between a *substantivist* and a *formalist* approach to the economies of pre-industrial societies. Because of the massive influence of social-anthropological research of the last 40 years or so, most archaeologists preoccupied with economy have opted for the former. The substantivist position has also held a dominant position in research into the inception of urbanization in Norway (e.g. Christophersen 1989a, 1991; Saunders 1995).

When Polanyi introduced his substantivist approach, it provided two fundamentally new elements in relation to the dominant economic theory of the time. In the first place, Polanyi saw *long-distance trade* as the root of market trade, in contrast to neoclassical economists who believed that trade was originally local and gradually expanded in scale. In the second place, Polanyi considered that pre-industrial societies were not subject to the classic economic laws concerning, for instance, the determination of prices according to supply and demand because all their economic transactions were fundamentally embedded in social relations; therefore, production, exchange and consumption could never be independent of social control. The price of an item was fixed by social conventions unaffected by supply and demand. (A summary of the position can be found in Kilger, this vol. Ch. 8:256–7; see also Skre, this vol. Ch. 9:328–33.)

The substantivist perspective has carried the understanding of pre-industrial societies a long way forward. Its essential premiss, that the economic mechanisms of these societies functioned *differently* from those in modern society, superseded a rather simplistic back-projection of contemporary explanatory frameworks that characterized much of the archaeological literature of the 1960s and before (Hodges 1999:227). From the 1970s onwards, it therefore became difficult to write about the exchange of goods in pre-industrial societies without including gift exchange amongst the modes of distribution. Scholars no longer took for granted that autonomous merchants were a feature of the Scandinavian Iron Age.

As the substantivist approach became conventional, it became evident to some scholars that the view of prehistory as *Other,* to use Moreland's term (2000b:2), had become over-dominant in relation to the formerly widely held idea of it as *Same.* Was it really possible that people in pre-industrial societies *always* exchanged goods free of self-interest and altruistically? One aspect of the substantivist approach, namely its neo-evolutionist mode of thinking, eventually led it up a blind alley. In Polanyi's own work the formulation of this model is often more subtle than one finds is the case in the work of some of his disciples (e.g. Service 1971; Sahlins 2004). Due to neo-evolutionist currents in Social Anthropology, Polanyi's various forms of exchange became linked to specific socio-political formations. Gift-exchange, for instance, was associated with primitive societies, while market trade was associated with modern society.

In this way the understanding of prehistoric economy became stereotyped and governed by a model with little space for nuance and variation. Such universal, stadial models made it difficult to conceive that several forms of exchange could exist side-by-side in a community; if that could be entertained at all, it was only in the form of marginal phenomena or transitional situations between one period and another. The economic life of the Viking Period, for instance, was readily treated as a transitional stage between the gift economy of the Iron Age and the later market economy (e.g. Samson 1991; Carelli 2001). Stadial models of this kind are an obstacle to a full grasp of the complexity and dynamism of prehistoric economy; moreover, they blur regional and chronological variation.

The substantivist mode of thinking does not recognize the economy of prehistoric society as having its own dynamics. Therefore, it locates all the causes of economic change outside of economic life itself, and rather in changes in the social structures and relations within which it considers the particular economy to be embedded. This substantivist mode of thinking has, for example, led scholars to identify socio-political (critically discussed in Skre, this vol. Ch. 9), ideological or religious phenomena (critically discussed in Skre 2007j:446–52) as the sole forces behind the expansion of the Western European economy in the period c. 600–1000. With that, they have more or less ignored the significance of the dynamic power that is inherent in production and consumption as well as in trade. As several scholars have pointed out in more recent years (e.g. Moreland 2000a, 2000b; Gustin 2004c; Sindbæk 2005), throughout this period, and indeed earlier, we have to account for the fact that in Western and Northern Europe there was production of goods for sale, trade using silver or gold as forms of currency, the determination of prices according to demand and supply, together with other economic phenomena which substantivists would characterise as market-economic. Also, researchers who have not taken up an explicit position in relation to the substantivist–formalist split have, on empirical grounds, developed comparable approaches to the economies in this period (e.g. Clarke and Ambrosiani 1995; Verhulst 1999; Lebecq 2000; Näsman 2000; Callmer 2002; Verhulst 2002; Ulmschneider and Pestell 2003).

1.2 The present volume

As already noted, two objectives have governed the structure of this book. The first of these is to publish empirical analyses of the media of exchange excavated at Kaupang (Part I: *The Kaupang Finds).* The items that are linked with the making of payment and that are presented and discussed in Chapters 3–6 are *coins, hacksilver, silver ingots of regulated weight, weights* and *balances.* Naturally, most emphasis is placed upon the finds from Kaupang, but the authors incorporate comparative material to be better able to identify and interpret the patterns and features of the media of exchange at Kaupang.

The second objective has been to discuss trade and urbanization in the Late Iron Age and Early Viking Period of South-Western Scandinavia from both a theoretical and an empirical perspective (Part II: *Silver, Trade and Towns).* Both an empirical and a theoretical mode of developing an understanding of prehistoric economy are explored along the lines outlined above. In this part of the book, attention is moved to a wider perspective than Kaupang alone, to encompass a Scandinavian view. In Chapter 7, the chronology of the importation of dirhams to Scandinavia is discussed, while in Chapter 8 the fundamental structures of thought that underlay the various uses of silver as a form of currency from the pre-Viking centuries down to the end of the 1st millennium are examined. In Chapter 9, an alternative approach, *the post-substantivist approach,* to prehistoric economy is developed, while the various categories of specialized sites in Scandinavia concerned with craft and trade in the period c. AD 600–1000 are analysed and typologized. Finally, Chapter 10 contains a discussion of currency and economy agency in connexion with the various types of specialized sites for craft and trade.

This emphasis on both empirical analysis and theoretical discussion is based upon a firm conviction that both approaches are of equal value in the enterprise of understanding the distant past. There is a major difference between these two, in that while empirical analyses do not need an explicit theoretical basis to produce crucial and valuable contributions, it is only when theoretical reflections are applied to a body of empirical data that such analyses can contribute to a concrete understanding of the past. Consequently, the value of the post-substantivist approach to the understanding of prehistoric economy developed in Chapter 9 stands or falls by the results that are produced through its encounter with the empirical material as attempted in Chapter 10.

The work on the various chapters in this volume has only partly been undertaken concurrently. As far as possible, however, the drafts were circulated amongst the authors. It has not been the aim to make the contributors harmonize their conclusions but rather, that they should take account of each others' conclusions, let them inspire their own discussions and arguments, and point out disagreements. While the editor has taken care that there should not be any inconsistencies between the chapters in respect of empirical information about the finds from Kaupang, no attempt has been made to harmonize the various authors' methods and views. Thus the reader will find that Blackburn, for instance (Ch. 3:41), in assessing the factors which influence the composition of the currency, places a confidence in the "wastage model" that Kilger does not share (Ch. 7:210–11). The reader will also find both parallels and some clear disagreements between Kilger's conclusions in Chapter 8 concerning the development of currencies and Skre's conclusions presented in Chapter 10. It is hoped that the reader will agree that such disagreements add to the interest and stimulation this book offers.

1.3 Future volumes

Since the publication of Volume 1, the schedule of publication that was presented in that volume has been modified (Skre 2007b:16–18). The projected Volume 6 (referred to in Vol. 1 as Skre, in prep.) has been removed from the schedule and the material intended for it has been redistributed to the current volume (Skre, this vol. Chs. 9 and 10) and the forthcoming Volume 3.

Introduction to the Site 2

LARS PILØ, DAGFINN SKRE

To make full use of this book, it will help the reader to know the most important results of the work at Kaupang. A comprehensive account of the results of the archaeological excavations and recording undertaken there from 1998 to 2003 has been published in volume 1 of this series (Skre 2007a). Also found there are summaries of the previous excavations and research findings, with references to earlier publications. In that volume, Kaupang is additionally set into its local context of Skiringssal, and its relationship with south-western Scandinavia more widely is outlined. The main emphasis in what follows falls upon a description of the archaeological contexts of the artefactual finds from the fieldwork of 1998–2003.

The fieldwork of those years was the first stage of the Kaupang Excavation Project, which has been directed from the University of Oslo – also with the financial support of those institutions listed on the colophon page of this volume. In 1998–1999 only surveys and minor trial excavations were carried out. A major excavation of 1,100 sq m was carried out in the settlement area of Kaupang from 2000–2002, in addition to several minor excavations. From 1999 to 2001 the project undertook survey work and excavations at the neighbouring farmstead to Kaupang, Huseby. Finally a small investigation was undertaken of the harbour sediments of Kaupang in 2003.

In 2003 the second stage of the project also got underway, with a group consisting of thirty scholars from Norway, Sweden, Denmark, the United Kingdom and Germany working on Kaupang and Skiringssal. Besides the publication of the results of the excavations themselves (included in Skre 2007a), the aim of this phase of the project has been to publish the most significant aspects of the artefactual finds, to pick up some of the most important questions posed by the finds and the results of the excavations, to construct a comprehensive picture of Kaupang and Skiringssal, and to place Kaupang in its contexts of Scandinavia and the North Sea region. A conspectus of the studies that are in preparation can be found in Skre 2007b:18.

The present volume is one outcome of the work of these specialists. It is not the aim of the project however to publish the artefactual finds in their entirety; the material is available in its entirety to any interested scholar. An overview of the finds can be found in Pedersen and Pilø 2007:180–4.

2.1 Exploring Kaupang and Skiringssal 1771–1999

The study of Skiringssal in the 19th century was shaped by the gradual adoption and examination of new sources (Skre 2007c). The antiquarian and textual sources were first collected by the cartographer and antiquarian Gerhard Munthe in 1838, and the location of Skiringssal was established by his work. Munthe concluded that the *Sciringes heal* that is referred to in *Ohthere's travelogue* of c. AD 890 was the same Skiringssal that was named in sagas of the early 13th century and in *Ynglingatal* from c. AD 900 (Skre 2007h). These sources indicated that there had been a temple at Skiringssal, and that the Ynglings, the legendary royal dynasty of Norway, had had their royal homestead there. The name Skiringssal was no longer extant in the time of Munthe, but in two letters from the early 15th century he found it in use. It then designated parts of Tjølling parish in the far south-east of Vestfold. Munthe visited the place and down by the sea he found hundreds of barrows at the farm of Kaupang. Munthe concluded that both the name of the farm, which means "market place", and the good harbourage at the site, were evidence that this was where Ohthere's *port,* the trading site he had

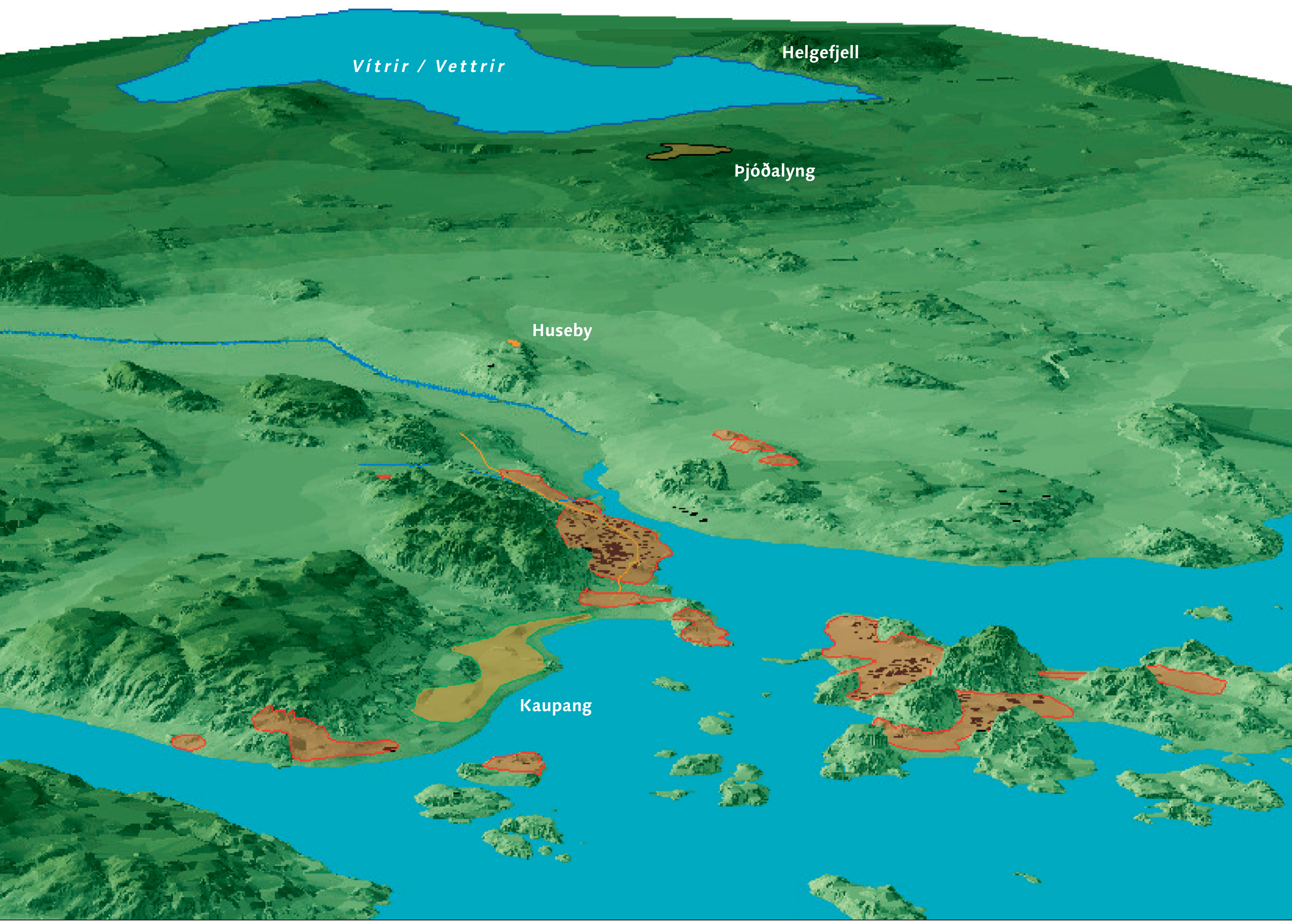


Figure 2.1 *The most important elements in the Skiringssal central-place complex as they are identified in Skre 2007a. Kaupang is the urban settlement surrounded by cemeteries. The northernmost cemetery, excavated by Nicolaysen in 1867, was located by the main road which led to and from Kaupang. This cemetery was probably where the petty kings of Skiringssal and their followers were buried. One kilometre along this road from Kaupang, at the farm of Huseby, the remains of a Viking-period hall were excavated in 2000–2001, probably the hall that gave Skiringssal its name. The road is likely to have continued further north to the thing site of Þjóðalyng. Just north of the assembly site was the lake Vítrir/Vettrir, whose name indicates that it was considered sacred. On the south-eastern shore of the lake lies the small but distinct hill called Helgefjell. This name also denotes a sacred location.*

Settlement area is marked in yellow, cemetries in red, known barrows in black. The level shown for the lake is its assumed original level. The sea-level shown has been raised 3.5 m from today's level to show its level in the early Viking Age. Illustration, Anne Engesveen.

visited on one of his journeys, had lain. In 1850 the historian P. A. Munch put Munthe's results into a wider Dano-Norwegian context, and went further in linking the site to the legendary royal dynasty of Norway, the Ynglings.

2.2.1 The cemeteries

The plea for archaeological work at Skiringssal made by Munthe and Munch was taken up by Nicolay Nicolaysen, the first Norwegian field archaeologist. In 1867 he made Skiringssal his first major archaeological project. He excavated 79 barrows at Kaupang, 71 of them in what appeared to be the main cemetery called *Nordre Kaupang* (Fig. 2.2). All graves from this cemetery are cremations. Nicolaysen employed local workmen, and this affected the quality of the excavation. The workers found a large number of small artefacts, such as weights, but we have to assume that some nevertheless went missing, and that the grave assemblies from the excavation of 1867 are probably incomplete.

With Charlotte Blindheim's excavations of burials and settlement remains at Kaupang from 1950 to

1974 there was a new surge in Skiringssal research. It was Blindheim who revealed the remains of the urban site at Kaupang and retrieved a significant collection of archaeological finds which provided a basis for dating the site and for assessing the craft, trade and connexions evident there.

Blindheim discovered the cemetery of Bikjholberget, consisting entirely of flat graves except for one small mound. The original number of graves there is assumed to have been around 160 (Stylegar 2007:77). In the years 1950–7 Blindheim excavated 74 of these. Forty-eight of these burials were in boats – 33 boats in all. Thus several boats had more than one body in them; in two instances, four. Both the large number of boat-graves and the fact that all of the burials were inhumations makes Bikjholberget different from all other cemeteries in the Oslofjord area. The graves at Bikjholberget were also more richly furnished than those at Nordre Kaupang, and the amount of imported material was higher. Blindheim therefore drew the conclusion that Bikjholberget was the *merchants'* cemetery; the site where the traders of Kaupang were buried. Her excavation technique was more careful than Nicolaysen's, and her excavation team better qualified. The ratio of grave goods retrieved was presumably greater as a result. However, as was normal at that time, the fill was not sieved. Thus some smaller objects may have been lost. Many of the graves were disturbed by later burials, but in some areas the stratigraphical relationships were extremely complicated. In consequence, the association of some objects with specific graves can be uncertain.

A total number of 204 graves and stray finds that probably derive from graves are known from the Kaupang cemeteries. If one includes the empty barrows and barrows containing nothing but layers or patches of charcoal, the number of excavated graves is 237. If one includes unexcavated burial mounds, 407 graves (i.e. buried individuals) can be documented – assuming that the unexcavated mounds contain one grave each. Based on various types of information a total of 700 graves can be estimated in all (Stylegar 2007:77). However, there is no doubt that this number is still an underestimate. Many flat graves are probably still undetected, and a large number of graves have been removed over the centuries without any finds from them being brought to any museum. The actual number of graves within the Kaupang complex could have been about a thousand, as suggested by Blindheim (et al. 1981:65; 1999: 153–4).

Of the 204 known burials from Kaupang, 116 contain closely datable artefacts. The first burials seem to have taken place around AD 800. Overall, there is a slight preponderance of burials of the first half of the 10th century as compared to the 9th. The general lack of burials with artefact-types dated to after c. AD 950 probably indicates that the cemeteries at Kaupang stopped being used regularly for burials somewhat before this time. Thus the apparently equal numbers of 9th- and 10th-century graves really conceal a much higher burial frequency in the later period. The barrow cemetery at Nordre Kaupang is distinguished by having a clear majority of graves from the first half of the 10th century.

To avoid the confusion resulting from the many different numbering systems that different excavators have applied to the Kaupang graves, a new series of numbers, each starting with Ka., has been allocated in the complete catalogue of excavated graves published by Stylegar (2007:103–28). This catalogue provides cross-references to all earlier numbering systems. In the present publication all references to graves use Stylegar's numbering. For reference to a specific artefact within a grave a letter is added to the number, the same letter as in the original catalogue.

2.1.2 The settlement

Prior to 1956 there had been no reported finds from the settlement area. (This section is based on Pilø 2007a.) In 1956 Blindheim started excavations in what was later seen to be the northern part of the settlement area, and excavations continued here on almost an annual basis until 1967, leading cumulatively to the excavation of a site of 1,350 sq m. A few minor excavations were conducted in other parts of the settlement area until 1984. The settlement excavations up to that year were published in full by Roar L. Tollnes (1998). These excavations documented structures that at the time were interpreted as the remains of houses, wells and jetties. In light of the more recent excavations however, those interpretations can now be questioned (Pilø 2007a). The main change is that the structures interpreted as houses are now considered to represent fences and stone foundations and supports at the lower ends of plots. Thousands of artefacts were recovered, including large quantities of imported material from most of northern Europe and from the Middle East.

For the times, the excavations of 1956–1984 were methodologically well conducted. The deposits were removed in spits and squares. An overall system of 2 x 2 m squares was employed. Spits were 10 cm thick. No, or very little sieving, took place, as was the custom at the time. The cultural deposits were generally termed "black earth" even though their colour and composition varied. Little emphasis was placed on stratigraphy. Since the deposits were removed in spits, it is now impossible, except in a few cases, to relate specific artefacts with certainty to the stratified layers documented in section drawings or photographs. For a more detailed presentation and evaluation of the evidence from the settlement area prior to 1998, see Pilø 2007a.

Blindheim excavations 1950-57
Blindheim excavations 1956-67, 1970, 1974
MRE excavations 2000-2002
Non-excavated barrow
Excavated barrow
Cemetery
Settlement area
Area with plot-division
Bjønnes
Nordre Kaupang
Hagejordet
Bikjholberget
Lamøya
Søndre Kaupang
Vikingholmen
0
200 m

Figure 2.2 *Settlements, cemeteries and single barrows in the Kaupang area. Map, Anne Engesveen.*

2.2 Fieldwork in the Kaupang settlement 1998-2003

In the spring of 1998 the preparations began for the excavations that would eventually take place from 2000 to 2003. Field surveys were undertaken every year from 1998 to 2002.

2.2.1 Research questions

The principal questions behind the fieldwork relate to two key topics (Skre 2007d): the debate over the first *urban sites* in Scandinavia – of which Kaupang appears to be an example; and the debate surrounding the *central places* of Scandinavia in the first millennium AD – of which Skiringssal appears to be one (see below).

The principal objective of the excavations planned at Kaupang was to decide whether Kaupang was one of the many seasonal market sites of this time or one of the very few towns established in the early Viking Period. With reference to the general objectives, the following five concrete research questions were defined as those that the fieldwork aimed to investigate:

- The character of the settlement – seasonal or year-round
- The layout of the settlement – possible plots, lanes, grouped buildings, open spaces
- Building-types
- The location and character of various forms of activity – trade, craft production, etc.
- The dating of the settlement, and possible changes in its activities and character

2.2.2 Overview

The fieldwork at Kaupang from 1998 to 2003 (described in Pilø 2007b) fell into two parts, with 1998–1999 as a pilot project period, which included surveys and limited trial trenching, and 2000–2003 being the main project period, which included a series of excavations in addition to continuing surveys. Geophysical mapping was also undertaken.

Surveys

Prior to 1998 excavations had only taken place in the northern part of the settlement area, and no systematic surveys of the entire settlement area had been undertaken. Very little was known about other parts of the settlement. Thus the surveys were designed to collect archaeological data over large parts of the settlement area.

The field surveys have led to the collection of 4,336 artefacts from the settlement area: 1,940 from fieldwalking and 2,396 by metal detection. The total area covered by the field surveys at Kaupang is approximately 62,500 sq m, most of which has been surveyed several times, both through fieldwalking and metal detecting. The total fieldwalked area is 60,000 sq m, while the total metal-detected area is 46,500 sq m.

The problem of displacement of artefacts due to ploughing and erosion in the slopes towards the Kaupang inlet was obvious even before the surveys started. Thus it is no longer possible to gain information on the location of activities based on the artefacts recovered from the ploughsoil, apart from on the central plateau. Even so the artefacts recovered have yielded important new evidence on the dating and the extent of the site as well as on the character of activities that took place there.

Only iron objects were not recorded during metal detecting – unless they could be identified by the archaeologists as dating to the Viking Age. During fieldwalking all materials were collected except non-tool flint, bone and iron (unless artefacts dating to the Viking Age could be identified).

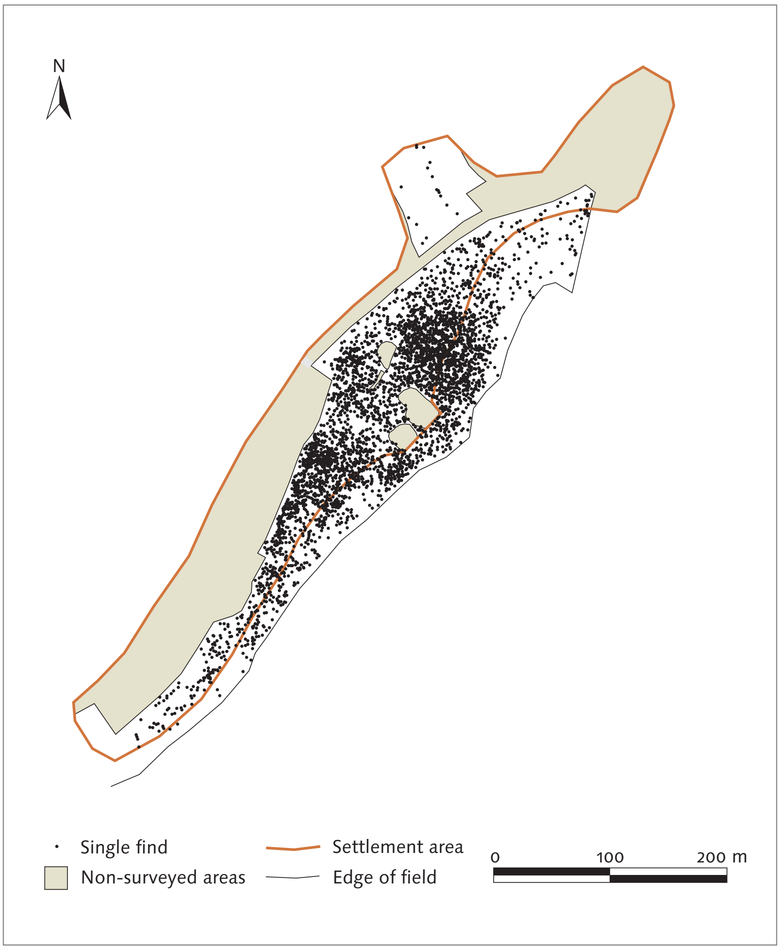


Figure 2.3 *Aggregated artefact recovery during field surveys 1998–2002. Illustration, Julie K. Øhre Askjem.*

Figure 2.4 *The main excavations at Kaupang 2000–2003. Contour interval 1 metre. Map, Julie K. Øhre Askjem.*

Excavations

The *main research excavation 2000–2002 (MRE)* was the key part of the fieldwork campaign at Kaupang. The excavation site was chosen because it was centrally located in the settlement area and distant from the site of the 1956–1974 excavations. In addition it had relatively well-preserved cultural deposits and a high density of surface finds.

The excavation site covered 1,100 sq m, of which 400 sq m were excavated down to the original beach deposit. It was situated between 3.5 and 6 m above present sea-level, and thus included areas suitable for settlement, as the Viking-age sea-level is estimated to have lain c. 3.5 m above the present mark. It also included the Viking-age beach in front of the settled area. The excavation area of 1956–1974 was situated between 1.0 and 4.5 m above present sea-level.

Several *cultural resource management excavations (CRM)* took place from 2000–2003 too. A large-scale excavation in areas affected by a new water and sewage system and a footpath was conducted in 2000, in advance of the MRE. This excavation was preceded by trial trenching in the autumn of 1999, covering 240 sq m within the site. The 2000 CRM excavations consisted of a series of trenches with a total length of 800 m. The trenches were normally 2–3 m wide, and the total excavation area covered 2,250 sq m. From 2000–2003 a number of additional shorter and narrower trenches had to be opened to allow connexions to be made between modern buildings and the new sewage system. These trenches had a total length of 650 m and covered an additional 610 sq m, bringing the total area excavated for CRM purposes at Kaupang in the years 1999–2003 to 3,100 sq m.

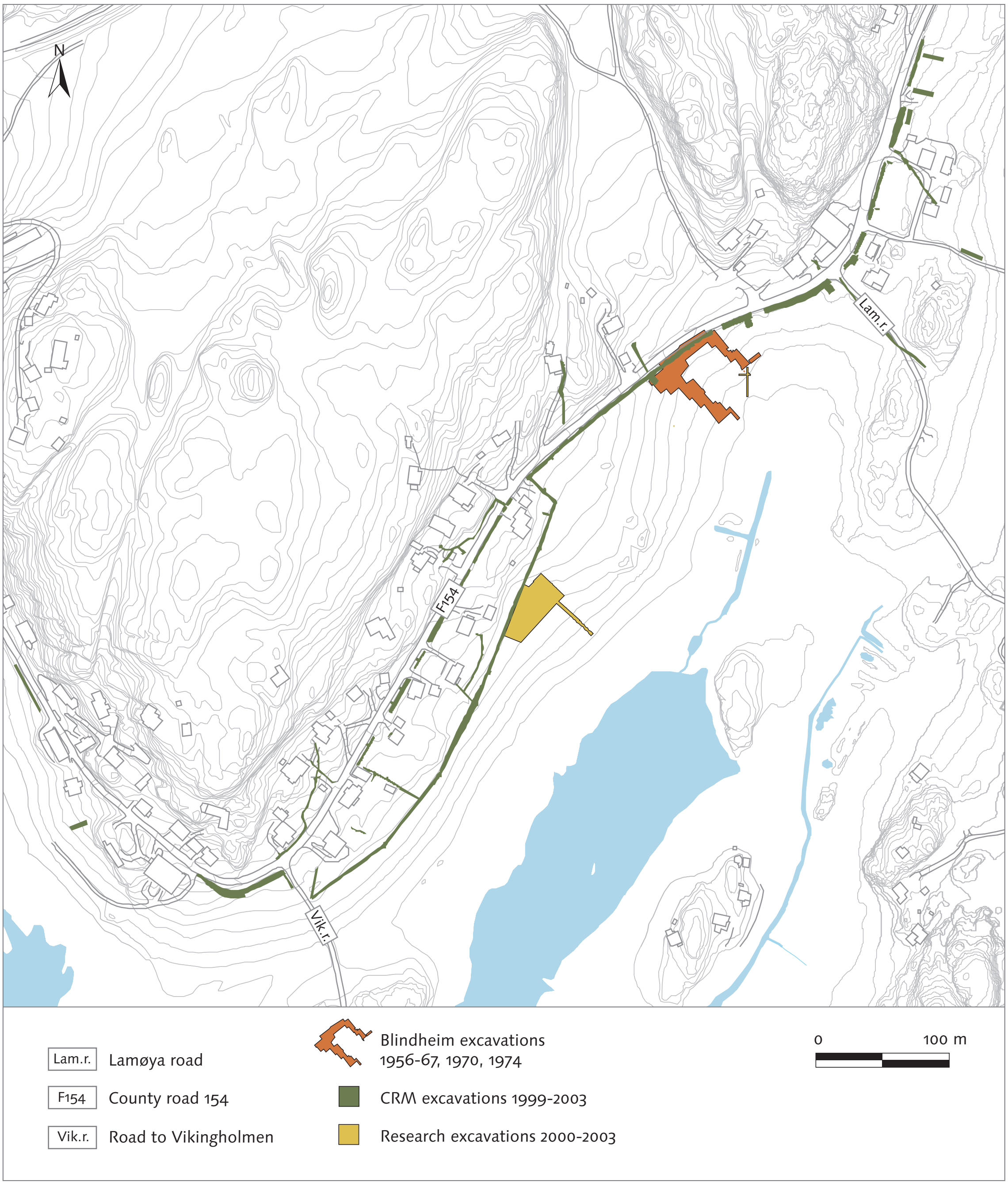
In effect, these trenches constituted a series of exploratory trenches all the way from the northern barrow cemetery through the entire settlement area to the southern barrow cemetery. The CRM excavations allowed new evidence to be gathered from parts of the settlement area which had previously seen very little or no archaeological activity. However, due to the narrowness of the trenches and extensive disturbance in the areas along the modern road, valuable information was collected only here and there from these excavations.

A test excavation was undertaken in the *harbour area in 2003,* c. 1.5–2.5 m below the Viking-age sea-level. Deposits which dated to the 9th century and possibly the early 10th century were found.

Method of excavation

The documentation method employed during the MRE was *single context* recording. Each layer and feature is recorded as a discrete individual context. The contexts are excavated in the reverse order to that in which they were deposited. Applying single-context recording at Kaupang was a demanding process. The cultural deposits in the settlement area are compressed and dry, and consist of humus, sand, silt and clay – except for the waterlogged deposits in some of the pits, which contain a broader selection of organic material. Many of the deposits were difficult to delimit, as they had been the object of intense bioturbation (disturbed by faunal activity, mainly earthworms) and leaching.

Stratified deposits were not expected in the area



investigated for CRM reasons because extensive testing with augers showed only a dark homogeneous deposit below the ploughsoil. However, as excavation quickly proved, stratified deposits were indeed present in the area next to where the MRE was to be conducted, even though auger testing had failed to identify them. In the CRM trench these deposits had to be excavated to a tight deadline, and full-scale stratigraphical excavation was not possible. This was unfortunate, and has made it difficult to correlate the layers and structures found in this excavation fully with those in the subsequent MRE.

All excavated deposits from intact contexts and from the later medieval plough-layer in the MRE were water-sieved. The basic mesh width used was 5 mm. In addition, part of each intact context, never less than 20% of the total, was sieved through a 2 mm mesh. In all, about 120 cu m of cultural deposits were sieved in connection with the MRE.

To enable the sufficiently precise location of artefacts retrieved from the water sieving of excavated deposits, layers greater than 1 sq m were separated into smaller units during excavation and recording, using 1 x 1 m squares, aligned with the national geographical grid system of Norway.

Full-scale sieving of the ploughsoil covering the MRE area was not possible, but measures were taken to recover a proportion of the artefacts during topsoil removal. The soil was removed in 2 x 2 m squares – in most cases in 10-cm spits to facilitate the use of a

Figure 2.5 *Plot-divisions in the MRE.*

Figure 2.6 *A schematic overview in perspective of the Site Periods of the MRE (see Pedersen and Pilø 2007:184–6 for details). The date range of the preserved deposits from Site Period III (fill in pits) is c. AD 840/850–900. Illustration, Lars Pilø.*

metal detector. 35% of the ploughsoil – or c. 95 cu m – was sieved. No bone or other material of uncertain or post-medieval date was collected from the ploughsoil. In spite of this, more than 1,400 unit finds were recovered from the ploughsoil covering the MRE area, including, for instance, slightly more than 2 kg of pottery.

The basic tool for field documentation at Kaupang was *Intrasis (= Intra-site Information System).* Intrasis is an archaeological information system for recording and managing field data. Further information is available at *http://www.intrasis.com*

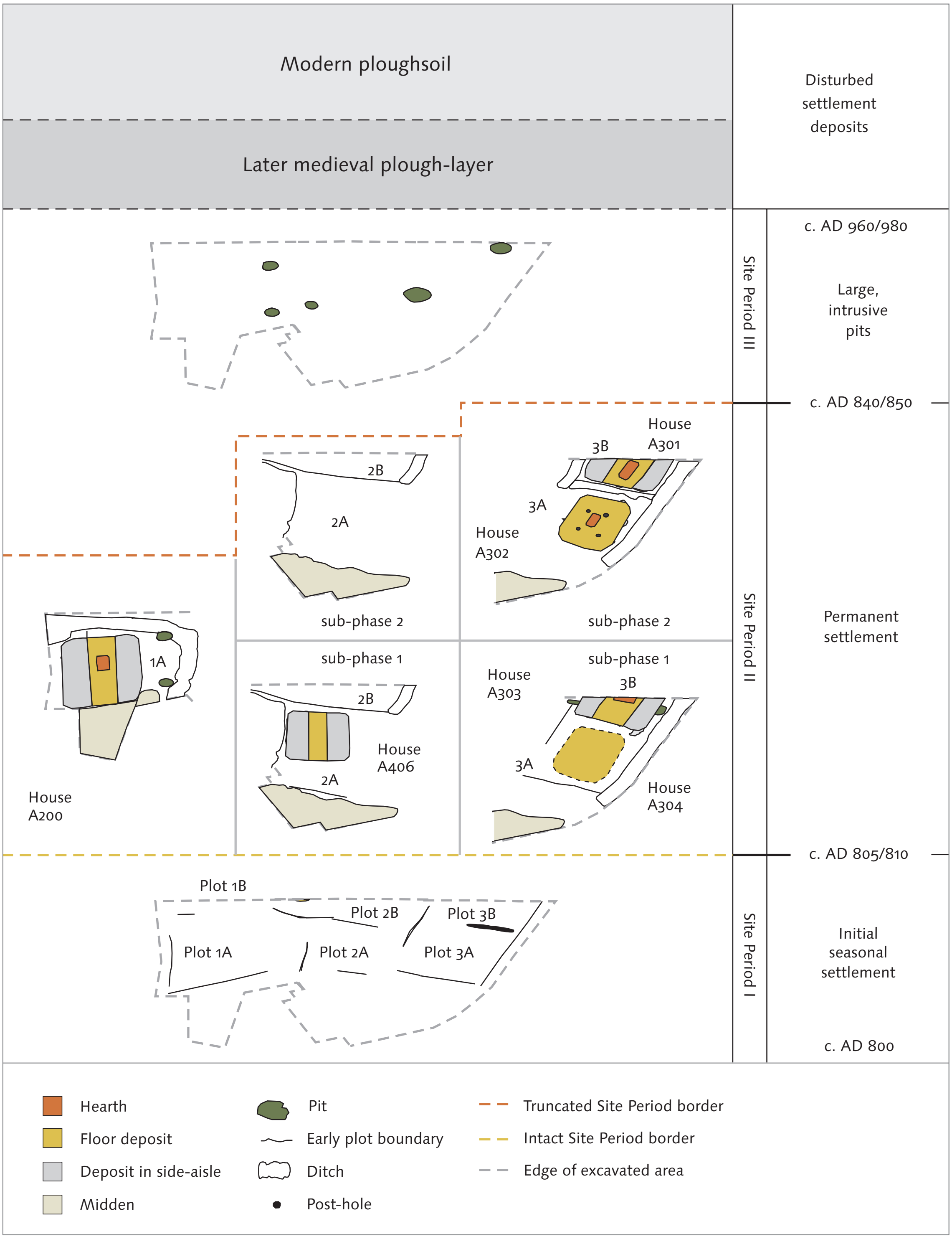
2.2.3 Contexts

The artefacts from the fieldwork at Kaupang 1998–2003 derive from both surface surveys in different parts of the settlement area and the excavation of specific sites within it. In total, more than one tonne of artefact and bone material was collected during all of the excavations and surveys 1998–2003. The proportion of broken and fragmented objects is high – as can be expected of settlement material largely consisting of discarded objects and waste. With a few exceptions, the datable artefacts belong to the Viking Age – with an emphasis on the 9th century, but continuing into the second half of the 10th.

Overall site phasing is always a difficult task in excavations with complex stratigraphy and even more so in excavations of sites with plot-divisions. The phasing within the individual plots is facilitated by the implementation of single-context recording in the field. However, inter-plot phasing regularly proves more difficult as stratification seldom can be followed across plot boundaries. This is due to the constant re-digging of ditches, renewal of fences, trampling, and other activities that took place in the divisions between the plots. This was also the case at Kaupang, and inter-plot phasing was thus impossible. Even so it can be seen that the same sequences are represented on most of the six excavated plots in the MRE – a development from a seasonal (Site Period [SP] I) to a permanent settlement (SP II and probably much of SP III), and a later truncation of the stratified deposits by ploughing, resulting in the formation of ploughsoil. Here and there a later medieval plough-layer was preserved beneath the modern ploughsoil.

Six plots were excavated from top to bottom (1A, 1B, 2A, 2B, 3A, 3B – only the A-plots were excavated in their entirety). In general it can be said that the deposits were best preserved on Plot 3B and least well preserved on Plot 1A, i.e. that the deposits were at their deepest (up to 25 cm) in the northern part of the excavation area and absent or nearly absent in the southern part. This is a direct consequence of a combination of ploughing and local topography. The northern part of the excavation area is at the lower end of a slope; hence, eroded soil from further up the slope washed into this area. This is also where the later medieval plough-layer was at its deepest (c. 15 cm). Modern ploughing has removed the later medieval plough-layer and most of the stratified deposits in the south.

Most deposits have been intensively bioturbated, which has probably led to a vertical displacement of some small artefacts (< 5 mm) such as beads and small pieces of bone. Thus single artefacts of small size cannot be used as dating evidence. In addition, the difficulty of discerning features in the deposits may have caused some small intrusive pits, postholes or other features to be overlooked during the excavation process. As a consequence, later material may have been assigned to an earlier level than it should have been. Large intrusive features would most likely have been visible in the naturally deposited beach sand below the archaeological deposits as the intact archaeological strata seldom exceeded 15–20 cm in depth. Few such undetected intrusive



features were recorded, only a few small post-holes. Thus the problem of undetected intrusive features is probably very limited.

The dating range of the stratified deposits is c. AD 800–840/850 for SP I–II and 840/850–900 for the intrusive pits in SP III. Judging from the artefactual evidence retrieved from the ploughsoil, SP III has originally extended up to 960/980. (For a more detailed presentation of site periods and artefact context, see Pedersen and Pilø 2007.)

Site Period I, which comprises the earliest, seasonal part of the settlement, appears to have been quite short-lived, probably less than 10 years, from around AD 800 until AD 805/810. It is very likely that the plots were laid out simultaneously, and therefore that the start date of this Site Period is the same on each individual plot. However, the length of this initial Site Period may vary from plot to plot, as some plots may have seen earlier permanent occupation than others. The main artefact-carrying deposits from this period are a number of outdoor occupation deposits. There was no settlement on the beach prior to the establish-

Figure 2.7 *The platform after excavation, facing south. Photo, D. Skre, Kaupang Excavation Project.*

ment of the seasonal settlement, and the artefactual material should be chronologically "clean", with the few possible exceptions stated above.

Site Period II contains deposits from the earlier part of the permanent settlement. The upper parts of the deposits from this period were truncated by ploughing. Based on dendrochronological evidence from intrusive pits from SP III, the preserved deposits should be dated from c. AD 805/810 to c. AD 840/850. The deposits from SP II are very varied, and include occupation deposits in houses, midden layers, levelling layers, hearths, pits and ditches. SP II can be divided into sub-phases 1 and 2 (SP II.1 and SP II.2) on Plots 3A and 3B, as these plots contained evidence of consecutive buildings. The same subdivision has been made on Plot 2A, where a building erected in sub-phase 1 was demolished in sub-phase 2, when the plot was left open. SP II on Plot 2B could also be divided into two sub-phases, but only an animal shed was found there. There has been too much damage by ploughing on Plots 1A and 1B to support any division into sub-phases there, even though the presence of intrusive post-holes suggests that consecutive buildings were erected there as well. The digging of large pits began in SP II and it is thus likely that at least some residual material is present amongst the artefacts attributed to this period, especially in secondary deposits.

As mentioned above, the deposits from SP II were truncated by later ploughing, and therefore the later settlement activity at Kaupang is assigned as a whole to *Site Period III.* Thus the transition from SP II to SP III is created by post-depositional processes, not by a functional change as was the case in the transition from SP I to SP II. The transition from SP II to SP III is not contemporaneous within and between plots, because of the different degree of plough damage to the deposits on the different plots. Except for intrusive pits and deposits in the harbour, there are very few preserved deposits from SP III. The stratified material from this period derives mostly from the secondary fill of pits, which also suggests that at least some of the material attributed to this period is residual. Only a few of the pits can be dated dendrochronologically. The latest date is from a loose piece of wood in the backfill of pit A9422 dated to AD 863. No artefactual finds contradict that this may be the end date of the deposits in these pits, but as the number of artefact recoveries from the pits is very limited, the fills in some of the pits may be later than this date. Based on the lack of 10th-century finds in the pits, AD 900 is assumed to be the latest date possible for the pit fills. Looking at the evidence from the cemeteries and the harbour, it seems likely that the permanent settlement at Kaupang continued into the first three or four decades of the 10th century. The artefactual evidence from the settlement area, i.e. coins and glass beads, even indicates some activity at Kaupang as late as AD 960/980. However, the character of this final period, whether the activities were permanent or only seasonal, remains indeterminate.

The stratified deposits were covered by two plough-layers. A *later medieval plough-layer* covered part of the excavation area. Associated with this layer was a post-Viking-age road. The later medieval plough-layer contained artefacts from disturbed Viking-age deposits and some with a late-medieval date. The *modern ploughsoil* covered all of the excavation area. The two plough-layers, even though they were both disturbed, were separated during phasing. It was assumed that the displacement of artefacts was less pronounced in the later medieval plough-layer than in the modern ploughsoil, and that the later medieval plough-layer is devoid of modern material. The artefactual material in the later medieval plough-layer is a mixture of artefacts from different contexts – from disturbed deposits from SP I to SP III, and from the later medieval farming activities. The num-

ber of post-Viking-age artefacts is very limited, and most artefacts associated with the later medieval plough-layer (with the exception of iron slag) may be said with confidence to belong to the Viking-age settlement.

2.3 Investigations in Skiringssal 1999–2001

In the 1st millennium AD a series of sites emerged in southern Scandinavia that are usually referred to as *central places* and which were evidently crucial to fundamental social organization, particularly juridical and cultic, within territories. In each case there seems to have been an aristocratic household at the heart of the central place. Several such sites also produce evidence of trade and craft.

Documentary, archaeological and place-name evidence alike testify that Skiringssal was a central place. Three sites in the vicinity of Kaupang could be associated with central-place functions (see Fig. 2.1), and these have been studied in greater depth, both archaeologically and through the examination of textual and topographical evidence. A study of the toponymical data from the area has made a particularly important contribution (Brink 2007). The three sites are a hall site at Huseby, about 1 km from Kaupang (Skre 2007e); an assembly place (thing-site) at *Þjóðalyng,* a good 2 km from Kaupang (Skre 2007g), and a *cemetery* that lies only a couple of hundred metres from Kaupang (Skre 2007f) along the track that leads from the town up to Huseby and *Þjóðalyng.* About 300 m north of *Þjóðalyng* a lake has been located that seems to have played a part in certain aspects of the function of the assembly place. This lake was called *Vítrir/Vettrir* ("the lake where supernatural beings dwell" or "the lake dedicated to gods and supernatural beings"), and on its south-eastern shore lay the mountain *Helgefjell* ("holy mountain").

Since the Kaupang Excavation Project has undertaken fieldwork at Huseby, this site alone is described in more detail here.

2.3.1 Fieldwork at Huseby 1999–2001

In 1999 the surveyors for the Kaupang Excavation Project discovered a building platform at the farm of Huseby, about 1 km north of the settlement area at Kaupang. The platform was some 36 m long and 13 m wide, and its longer sides were bowed. It was situated on the crest of a rocky hillock, where a building will have been widely visible.

When the platform was constructed, a barrow of the 4th or 5th century AD had been laid flat. Between 200 and 300 cu m of soil and stone had also been brought up on to the hillock to build the platform. On comparable platforms in the area around the Mälar Lake in Sweden, halls have been found that were built in the 8th century and stood until the end of the Viking Period. A trial excavation was undertaken in 1999 and most of the surface of the platform was excavated in 2000 and 2001.

Because of the very difficult ground conditions, no definite post-holes from the hall-building were identified, although there were several likely candidates. It is possible, nevertheless, with particular reference to the foundations of the long walls and two probable post-holes, to propose what the ground-plan of the building was like. Activities in the centuries following the Viking Period have disturbed the soil so that stratified layers from the functioning period of the platform are virtually entirely lost. Artefacts from the Viking Period to modern times have been found together in the soil covering the platform.

A range of Viking-period finds from the platform can be linked to an aristocratic context. Alongside the shape of the platform and the building these clearly point to an aristocratic residence – a *hall* – having been placed on the spot. The finds show that the building was raised some time in the second half of the 8th century. It most probably went out of use at the beginning of the 10th century.

The name *Skiringssal* occurs in sources written in the period c. AD 890–1445. It then appears to denote an area, possibly of about the size of the parish of Tjølling or a little less. But *Skiringssal* must originally have been the name of a building, a *salr* or "hall". It is probably the remains of this hall that have been revealed by excavation at Huseby. As well as serving as aristocratic residences, such halls were also the locations of cult feasts.

2.4 Main results 1998–2003

In the course of the 8th century it appears that the *thing* site, the *hall* and the cemetery were established as the core elements of the Skiringssal central place complex. The first two of six generations of Ynglings in Viken, Halfdan Whiteleg and Eystein Fart, can be linked to the establishment and early growth of the complex. By around AD 800, when the town of Kaupang was founded as the final component of the central-place complex, Skiringssal had already served for several decades as a central place within Vestfold and perhaps even Viken as a whole (Skre 2007i).

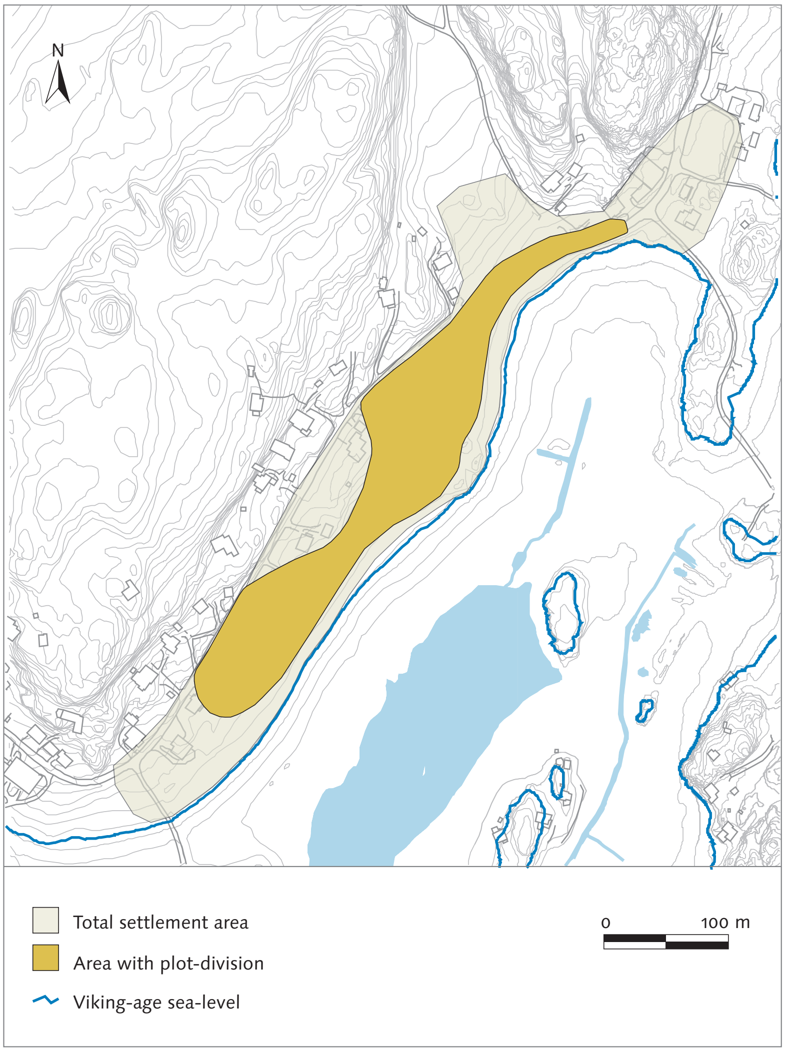
The town seems definitely to have been *founded* in the sense that the whole or most of the urban area was in one act divided into plots. There are no traces of activity prior to the division of the site into plots, as one would expect if new areas were divided into plots in the course of phases of urban expansion (Pilø 2007d). The founder must have been the Danish king who ruled in Viken in this period. Around the area with plot-division, which covers c. 20,000 sq m, there is a zone with finds of a Viking-age date but without traces of permanent construction. This zone, which covers c. 34,000 sq m, is probably where temporary visitors stayed in tents or other temporary shelters.

One fundamental reason why the town was established in Skiringssal appears to have been that the combination of the sacral character of the central place and the military power of the local leader guaranteed secure trading conditions. In this respect, Kaupang differs from the two other towns of the Danish king's realm, Ribe and Hedeby, which do not appear to have been connected to central places. The three towns nevertheless shared one conspicuous feature – they were all positioned on the borders of the king's territory. It seems likely that the three towns were founded by the Danish king on the model of the Frankish and Anglo-Saxon *emporia* or *wics* which, *inter alia,* served to represent a strong royal presence at the frontier (Skre 2007j).

That Kaupang was home to a permanent population from c. 805/810 onwards is revealed by the building-types, the quantity and the types of finds representing household activities, and finds of the bones of birds that were caught and timber that was cut in the winter months. The swift transition from seasonal to permanent occupation on the plots excavated – probably a process taking less than a decade –indicates that permanent settlement was intended from the inception of the division into plots. More precise information on the duration of this process is available from only some of the plots in the main research excavation area. However the finds from fieldwalking reveal no clear chronological differences in the commencement of occupation in different sectors of the settlement area – nor in its end either. Both early and late finds are ubiquitous. At the same time, there seem to be no marked distinctions of activity zones in various parts of the settlement.

The evidence of six buildings that were excavated in the MRE area provides us with only limited information on their construction technique. However, as far as the state of preservation of the evidence permits any conclusions to the drawn, certain features seem to be consistent. The buildings were of a form – a three-aisled ground-plan with a central hearth – that reveals them to have been houses, an inference which the finds from all the buildings corroborate. All of the

Figure 2.8 *Estimate of the Viking-age settlement area at Kaupang. Map, Julie K.Øhre Askjem.*



houses also produced some evidence of craft production, such as beadmaking, metalcasting, amberworking and textile production, so that the buildings are to be regarded as multi-functional. No dedicated dwelling houses or workshops have been found, although we cannot exclude the possibility of there having been some (Pilø 2007d).

Information on building-types is available only down to the mid-9th century. However the types and quantities of finds, sediments in the harbour, and the persistence of burial, indicate that occupation and activity actually increased after that phase, and continued at a high level into the second quarter of the 10th century. But the burials and settlement finds from that date down to the cessation of activity around 960–80 are too few to provide a picture of the extent and character of settlement and business in this final phase.

Around the date of the establishment of Kaupang, the petty Yngling king seems to have moved to Borre in northern Vestfold. The authority of the Danish king over Skiringssal and Viken apparently diminished at the end of the 9th century, allowing the Ynglings to recover their position in Skiringssal. The transition to Christian religious practices in Viken in the middle of the 10th century and the consequent demise of both pagan cult activities and the sacral character of Skiringssal were probably key factors in the abandonment of Kaupang at that time (Skre 2007j).

Part I

The Kaupang Finds

The Coin-finds 3

MARK BLACKBURN

The rich coin-finds from Kaupang are discussed in this chapter in the context of finds from other Viking-period sites, looking in particular at their period of use and loss as a means of dating activity on the site. Their circumstances of discovery, distribution within the site, fragmentation and secondary treatment are also considered.

A total of 101 single finds, plus a cake of fused coins and hacksilver from the base of a crucible, have been found in the settlement area during both the earlier and recent campaigns of excavations and surveys. These are described and illustrated, along with four coins from Huseby, in the Catalogue (this vol. Ch. 4). The majority of the coins are Islamic silver dirhams struck between AD 698 and 955, but there are also two Late-Roman and one or two Byzantine bronze coins, one 7th-century Merovingian gold tremissis, and six Western European silver coins of the 9th century.

This study seeks to apply for the first time to Scandinavian find-material methods of interpretation of site finds that have been developed for Roman coins and for Early-medieval coins from England and the Continent. The Scandinavian finds present particular difficulties of interpretation because they consist mainly of imported coins that could remain in circulation for decades or even centuries after their date of production. In order to estimate their period of circulation, it is necessary to compare their age-structure with those of other sites and hoards. Questions of how representative hoards are of local currency, whether fragmented coins have a similar age-structure to whole coins, and the evidence of stratified finds from three sites at Birka, are considered.

Apart from a Merovingian gold tremissis of the 7th century, all the coins appear to have been lost during the 9th and 10th centuries. Although the Islamic dirhams first arrived in Scandinavia c. 800, it is argued that they were only used in Kaupang, at least in significant numbers, after the mid-9th century. During the first half of the 9th century the coins used at Kaupang appear to have been mainly Western silver coins – Anglo-Saxon, Carolingian and Danish. The Islamic coins show a greater dominance of pre-890 issues than any of the other Scandinavian sites considered or in a sample of isolated finds from Southern Scandinavia. After their active use during the second half of the 9th century, there was a marked decline in Islamic coins that occurred sometime between c. 890 and c. 920. Very few dirhams appear to have been lost during the third quarter of the 10th century, but there was a minor revival in their use c. 960. Coin use appears to have ceased by c. 980 or earlier.

Only two of the 92 dirhams show signs of having been adapted as jewellery, and the great majority were merely pieces of coins that had been divided for use in lower value transactions or to make precise weight-adjustments. This, and the presence of a considerable quantity of hacksilver and weights, testifies to their economic role at Kaupang. Only three Carolingian and Anglo-Saxon coins came from stratified layers which dated c. 810–c. 840/50, and the remaining 98 single finds and the fused hoard were all found in the later medieval or modern ploughsoil. They were distributed over the entire settlement, but with concentrations either side of the central raised plateau. Many had drifted in the ploughsoil below the line of the Viking-period water front.

	Excavations Blindheim 1956–1974	Skre 1998–2003	Total
Roman			
Constantine I (307–337), bronze	-	1	1
Valentinian I (364–375), bronze	1	-	1
Byzantine			
Uncertain bronze, 8th–10th century	-	2	2
Merovingian			
Dorestad, gold tremissis, c. 650	-	1	1
Carolingian			
Louis the Pious (814–840)	2	1	3
Anglo-Saxon			
Coenwulf of Mercia (798–821)	2	-	2
Danish			
Nordic (KG5), c. 825–840	1	-	1
Islamic			
Umayyad, 698–750	-	4	4
Abbasid, 750–892	9	56*	65
Samanid, 902–955	-	7	7
Volgar Bulgars	-	2	2
Unidentified	12	2	14
Total	**27**	**76**	**103**

* *Includes two that are part of a larger group of fused coins and hacksilver (No. 102).*

Table 3.1 *Summary of the coin-finds from the Kaupang settlement (coins are silver unless indicated).*

3.1 The coin-finds: discovery and context

This chapter discusses the significance of the Viking-period and earlier coin-finds from Kaupang and Huseby. The coins themselves, both from the excavations of 1956–1974 and from the recent surveys and excavations of 1998–2003, are listed and illustrated in the Catalogue (Rispling et al., this vol. Ch. 4). Entries in the Catalogue are referred to here by their number (1–102 for Kaupang finds, and Hu1–4 for those from Huseby). Post-medieval coins have been excluded from the Catalogue and will not be considered here. A preliminary report has appeared in Blackburn 2005c. The number of coins by category from the settlement area is summarised in Table 3.1.

3.1.1 The earlier finds, 1950–1974

During the 1950–1957 excavations of the Bikjholberget cemetery, to the north-east of the settlement site, items that may have been silver coins were said to have been found in three graves, but these were so corroded that they disintegrated before they could be identified: Ka. 280, Ka.305 and Ka. 308 (Blindheim and Birgit Heyerdahl-Larsen 1995:33, 36 and 81; Blindheim et al. 1999:119; Stylegar 2007:Catalogue. For grave numbers (Ka.), see Stylegar 2007:128). Still more doubtful is the identification as a possible coin based on some fragments of metal associated with a leather purse in a fourth grave: Ka. 262 (Blindheim and Birgit Heyerdahl-Larsen 1995:66; Blindheim et al. 1999:119 and fig. 8; Stylegar 2007:Catalogue). There was also a bronze nummular brooch found in a female grave probably of the 10th century (Ka. 259; Blindheim and Birgit Heyerdahl-Larsen 1995:pl. 52; Stylegar 2007:Catalogue). This is a cast copy in bronze of a brooch with a central coin or coin-ornament set in a border of five strings of filigree, a form that is typical of Carolingian or Anglo-Saxon bronze brooches of the ninth and tenth centuries. The brooch is so corroded that the design on the "coin" cannot be identified.

Charlotte Blindheim's excavations on the settlement site at Kaupang from 1956–1974 yielded 27 coins or coin fragments. These excavations were conducted on one area of 1350 sq m in the northern part of the settlement. The finds built up progressively over several years (1959, 2 coins; 1960, 3; 1962, 1; 1963, 4; 1964, 8; 1965, 2; 1966, 2; 1970, 4; uncertain date, 1). Those from the first three seasons, which comprised two Carolingian, one Anglo-Saxon and an early Danish coin, with three fragments of Islamic dirhams, were very fully discussed and illustrated by Kolbjørn Skaare (1960a, 1960b, 1963). Subsequent finds, mainly of fragmentary dirhams, were briefly reported in the annual accession reports of the Oslo University Coin Cabinet in the *Nordisk Numismatisk Årsskrift* (1963: 202, 1964:137, 1965:147, 1966:153, 1968:160, 1971:202). By 1969 Blindheim was able to summarise 19 coin-finds from the site based on Skaare's identifications, which indicated that "they should all be dated to within the three last quarters of the ninth century" (Blindheim 1969:16 and 35).

Skaare's own summary of the finds in 1976 was of the 27 coins known today. These were one Roman, two Carolingian, two Anglo-Saxon, one Nordic, 20 Islamic and an unclassified coin. Of the 20 Islamic dirhams he was able to identify only six with any degree of precision, these spanning the period 720–750 to 844–854, while he classified 18 as unidentified Abbasid dirhams (750–890) and one as of uncertain dynasty (Skaare 1976:139, no. 48). These Islamic coins were particularly difficult to attribute, and although Skaare would not claim to be a specialist in Islamic coins, Rispling, who has worked primarily with such material for 30 years, was only able to get a little more out of them in 2002–2003. He changed some specific attributions, but he left four coins as uncertain

	Excavations	Surveys
1999	-	1
2000	2	29
2001	15	18
2002	1	8 + group
Total	**18**	**56 + group**

Table 3.2 *Number of coin-finds discovered in excavations and surveys, 1998–2003.*

Abbasid (833–892) and a further 12 as of uncertain dynasty (698–955). For some reason the coins found in Blindheim's excavations were generally in a worse state of preservation than most of the recent finds, and this is not because they have suffered significant further decay since they were found. The Roman bronze coin of Valentinian I (364–375) was omitted from Blindeim's report, and Skaare expressed doubt about whether it was a primary find (Skaare 1976:33 and 139), although it is regarded below as a Viking-period loss.

In terms of context, virtually all of the finds from Blindheim's seasons of work came from the "black earth" overlying the various excavation sites. This was the medieval plough-layer, and although the excavations were conducted with non-stratigraphical spit-digging that is not significant as the finds must all represent coins that had been disturbed from Viking deposits by later ploughing. Based on Pilø's and Skre's reassessment (this vol. Ch. 2:17) of Blindheim's excavation, only two coins can be related to a Viking-period context: a Carolingian denier of Louis the Pious (No. 8) and an Anglo-Saxon penny of Coenwulf of Mercia (No. 10), which were found within 20 cm of each other on the same day in 1959, and while there is no information about whether they are from the same context, the coordinates suggest it is likely that they both derive from an intact deposit under the inner stone line of Blindheim's House 1. They may have been deposited as a pair or they may have been separate losses sealed by a common feature. The distribution of the coins over the excavation site is discussed and shown in plan by Pedersen (this vol. Ch. 6:164, Fig. 6.31).

Not withstanding the poor condition and residual nature of so many of these earlier Kaupang coin-finds, they were rightly recognised by Skaare as very remarkable and important evidence for 9th-century Norway.

3.1.2 The new finds, 1998–2003

The new campaign of investigations led by Dagfinn Skre has added a further 74 separate coins and a small fused "clump" from Kaupang, plus four coins from the high-status site at Huseby. This quadruples the number of coins from the site, and provides us with a far more representative distribution across the settlement area. Importantly, of the 74 new coins only two are beyond identification. Only 18 coins came from excavations, while the remaining 56, plus the fused group, were recovered during metal-detector surveys over the years 1998–2003 (Tab. 3.2).

The location and conduct of these excavations and surveys has been described by Pilø (2007b). Two coins were found during the CRM (cultural resource management) excavations in 2000 in preparation for a new water/sewerage system and pedestrian path running 800 m across the site. They came from the medieval plough-layer. The MRE (main research excavation), an area of 1100 sq m to the south of Blindheim's excavations, yielded 16 coins in 2001–2002. Only one of these coins was from an intact stratified context (a Carolingian denier of Louis the Pious, No. 7) from plot 4A (Site Periods I–II dating to the first half of the 9th century), and the remainder were from residual disturbed layers, namely the later medieval plough-layer and the modern ploughsoil. During its removal the modern ploughsoil was metal-detected and 35% of it was sieved (Pilø 2007b:157; Pilø and Skre, this vol. Ch. 2:19–20). The later medieval plough-layer was all water-sieved. As a result eight coins were recovered from the modern ploughsoil and seven from the later medieval plough-layer. The deposits excavated from intact contexts were also water-sieved after excavation, which is important to note as the absence of any dirhams in this earlier horizon of the site is of significance. The locations of the coins found in the main research excavation are discussed and illustrated in plan by Pedersen (this vol. Ch. 6:162–4).

A metal-detector survey in 1999 produced one coin, while a further 55, the bulk of the coin-finds from Kaupang, were recovered by the team of metal-detector enthusiasts who had been brought over in 2000–2002 from the Danish island of Bornholm to conduct a broad survey of the site, not limited to the excavation areas. This embraced a substantial strip either side of virtually the whole length of the Viking-period waterfront, as much as is currently available on agricultural land, and the finds were recovered from the modern ploughsoil. The whole of this area was surveyed at least once, but the northern part of the site and a short section in the south were surveyed twice, and the most central area, either side of the rocky plateau that divides the settlement, was surveyed three times by the detector-users. These areas are shown on Figure 3.20 below.

Taking the earlier and more recent finds from

Figure 3.1 *The hoard or crucible melt from Kaupang (No. 102), from above (**a**) and below (**b**). Photo, Eirik Irgens Johnsen, KHM.*

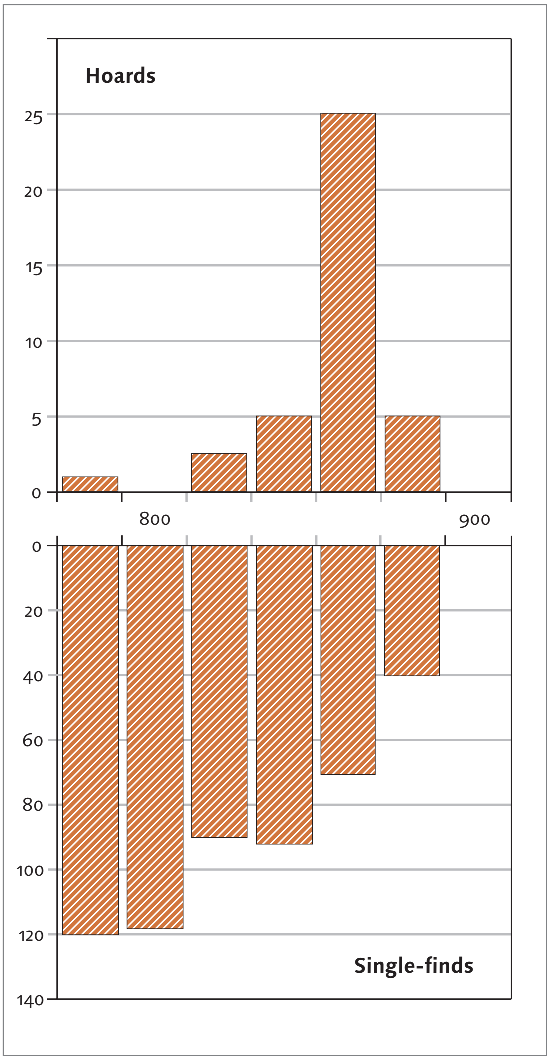
Kaupang together, only three of the 103 coins came from intact deposits, and these have special evidential value that will be discussed below. The remaining 100 coins were all from disturbed layers within the ploughsoil and with regard to context they can be treated as of comparable status to each other. They are cumulatively a very significant body of evidence. As Pilø and Skre (this vol. Ch. 2:22–3) point out, the disturbance was extensive, including in some parts of the site the whole of the Viking-period deposits, thus the finds should represent a fairly good chronological sample of the occupation. In the excavated areas, chosen for their superior degree of preservation, the latest of the intact layers date from the mid-9th century, although in parts of the excavation some earlier layers had also been destroyed by the plough. Within the ploughsoil some coins will have moved a considerable distance horizontally, and there will have been a general drift downhill, so that a close spatial analysis of the finds would not be justified. Nonetheless the distribution of the coins will be investigated below and patterns that emerge will be compared with the distributions of other artefacts.

The coin-finds from Huseby were recovered during the excavations of 2001. Although the site was occupied for much longer than the Kaupang settlement, both earlier and later, the earliest coins are two from the 11th century, after which there is a gap until the 15th century. The finds are discussed in section 3.6 below.

The "hoard", "clump", or crucible melt

A fused group of coins and pieces of silver (No. 102) representing a partially molten cake of silver from the base of a crucible was found in the modern ploughsoil in the north of the settlement. It weighed 29.81 g, equivalent to about 10 whole dirhams, but within the lump the remains of at least 12 fragmented coins and two pieces of hacksilver could be discerned (Fig. 3.1). The hacksilver pieces were two sections cut (not broken) from rectangular and cylindrical rods, and judging from their dimensions they would have weighed approximately 1.5 g and 5 g. Although the pieces were evidently collected to melt down in order to form raw material for a metal-working operation, rather than to keep as a store of wealth, the use of the term "hoard" is still appropriate, for they are associated objects deliberately gathered together for a purpose and lost or hidden on one occasion. Their evidential value is rather different from that of the single finds, as discussed in section 3.2 below.

Only two of the 12 coin fragments could be identified, one an Abbasid dirham of 782/3 and the other one of the period 750–816, giving the "hoard" technically a t.p.q. of 782. The group is impossible to date closely, but the fact that both are early Abbasid coins would make it more likely that this was assembled in the 9th century, although an early 10th-century date cannot be ruled out. The presence of relatively small pieces of hacksilver is significant. As Hårdh points out (this vol. Ch. 5:118, 1996:84–6, 91–130), Scandinavian hoards give little indication of the use of unminted hacksilver before the 10th century. Yet the early nature of the single find assemblage of hacksilver from Kaupang, including several pieces stratified in levels dated to the first half of the 9th century (Hårdh, this vol. Ch. 5:114), together with the site finds from Uppåkra and Birka and the exceptionally early hoard from Kettilstorp, Önum, Västergötland (t.p.q. 850), show that the use of fragmentary silver objects as a means of exchange started to develop during the 9th century. In England, the hoard from Croydon (deposited c. 871) and finds from Torksey (probably deposited c. 873) show that the practice was also known among Scandinavians in Britain at that time (Blackburn 2002). The Kaupang crucible "hoard", probably dating from the second half of the 9th or beginning of the 10th century, provides further



support for the view that the plentiful single finds of hacksilver at Kaupang were largely contemporary with the dirham-fragments found on the site.

3.2 The interpretation of site finds

The history of the bullion economy of Viking-period Scandinavia has been written very largely from the hundreds of silver hoards that have been discovered over the last three hundred years. Recently a new, complementary source of evidence has become available – that of the single and site finds. Of course, some single finds have been known since at least the 18th century, and archaeological excavations have in the past yielded coins, but for the Viking Period in Scandinavia it is the quantity and quality of the data that is now emerging that is superior to anything available previously. This section will discuss some of the theoretical principles of the interpretation of site finds, before turning to the Kaupang finds themselves in the next section. Although coins are only part of the total bullion used in exchanges, this chapter focuses on that element as the data are more precise and amenable to comparison. The convenient terms "currency" and "circulation" are used here in the context of the Western coin economies of Anglo-Saxon England and the Frankish Empire as well as the bullion or money-weight economy of Scandinavia, although the way in which they operated was markedly different. "Currency", in the context of Scandinavia, is a short way of saying the "composition of the coin element of the bullion stock", which may have been used in both economic transactions and social exchanges.

Hoards and single site finds are fundamentally different types of evidence, and they require different approaches to interpretation (Blackburn 2005b). Hoards are an invaluable source of evidence, for at their best they provide a detailed snapshot of the currency at a particular place and moment. However, they say nothing about the currency 20 years earlier or 20 years later. Each hoard has its own unique history of assembly, deposition and recovery, which needs careful consideration. For example, a hoard may be the fruits of trading during one season, or represent savings assembled over many years, and its contents may have been artificially selected for hoarding. Individual hoards may, therefore, have quite anomalous compositions, but where several hoards present a similar pattern, one has more confidence that they are typical of the currency from which they were drawn.

Single finds are in theory a series of separate losses, perhaps made over several hundred years. If they can be assumed to be mainly accidental losses, they should be random, and if the sample is large enough statistically, they may provide information covering the whole life of the site they were found on. They can often provide a more representative picture of monetary use than hoards. This is neatly demonstrated by comparing the deposition of hoards and single finds of the late 8th and 9th centuries in England (Fig. 3.2). Based on the hoards one might reasonably have thought that the later 9th century in England was a period of greater monetisation than the previous hundred years. Yet the single find evidence that has emerged in the last two decades shows that the opposite was the case; single finds and, by inference, the use of money seem to have declined in a period when hoards increase, since the campaigns of the Viking army after 865 prompted a large number of hoards to be deposited and not recovered. There are other examples from Early-medieval Europe where in a particular period or region there was a flourishing coinage although represented today by very few coin hoards. There are many factors affecting the rate of deposition of hoards and, more significantly, their non-recovery, which makes the number of recorded hoards a quite unreliable measure of the amount of coinage in circulation in a particular region or period. By contrast, single finds accidentally lost should provide a better statistical base, although here too

Figure 3.2 *Histogram comparing hoards and single finds from England, 780–900; dates reflect probable deposit of hoards or loss of single finds (Blackburn 2003).*

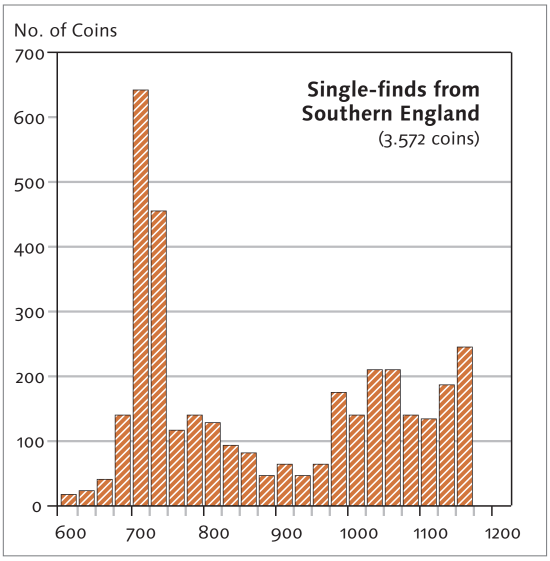


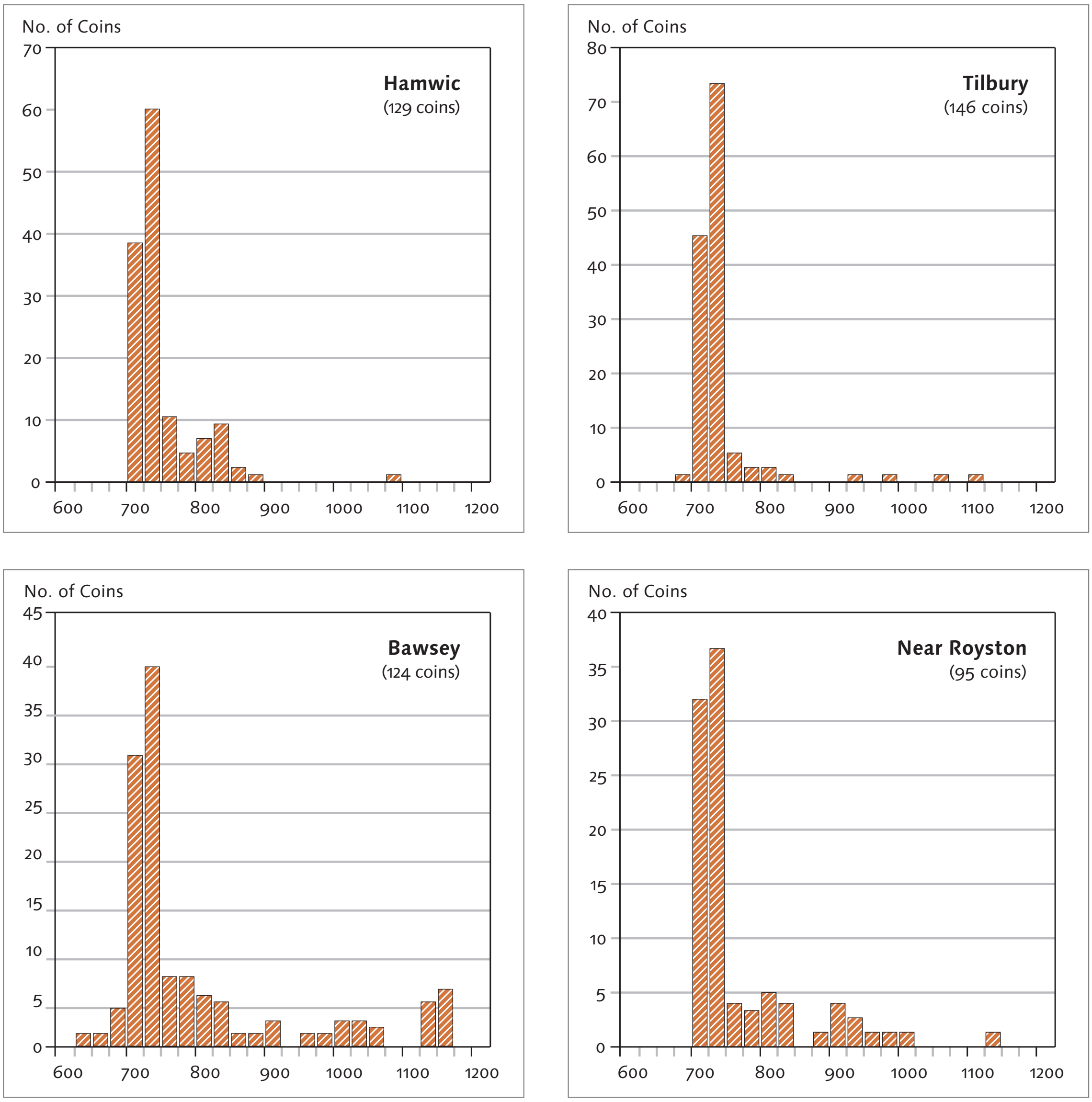
Figure 3.3 *Isolated single finds from England south of the Humber, 600–1180; dates reflect probable loss of finds (Blackburn 2003).*

there are also factors that will influence the original loss, recovery and recording of single finds from a particular site, giving bias to the data (Blackburn 1989a). While these will significantly affect the absolute number of finds recovered from the site or region, usually they should not change the proportions in which coins of different periods or origins occur in a sample. It may, then, be valid to compare the relative compositions of find assemblages from different sites, but not the number of coins found. Thus chronological fluctuations in monetary use are more readily determined than variations in the quantity of coinage available on different sites or in different regions.

3.2.1 The need to determine typical patterns of loss

When the site finds are plotted in a histogram chronologically they provide a visual impression of any fluctuations in coin-loss over a period. In interpreting such patterns it is important to distinguish between factors affecting the rate of loss that are specific to the site (e.g. the rise and fall of commercial activity on it) and those that are general to the region (e.g. the availability of coinage in different periods). It is absolutely essential to determine the latter (i.e. the typical pattern) before attempting to draw conclusions about activity on a particular site. In England, a large number of isolated finds of the Early Middle Ages have been found spread widely across the countryside, particularly in the regions to the east and south of the country. These have formed a useful control sample, plotted as a histogram (Fig. 3.3), to show the normal pattern of coin-loss in Southern England, and it does not, as one might have expected, reflect a progressive development and expansion of the monetary economy through the Anglo-Saxon period, for there is a surprising peak in the first half of the 8th century and a distinct trough at the end of the 9th (Blackburn 2003). This standard pattern can be compared with histograms based on finds from specific sites, such as the excavations at *Hamwic* (Southampton), and metal-detector finds from Tilbury, Bawsey and a site near Royston (Fig. 3.4). In preparing these histograms the data have been adjusted to reflect the probable dates of loss of the coins on the site, rather than simply their dates of production (see sect. 3.2.3). For each of these sites the significant feature of their coin-finds is not the dramatic rise at the beginning of the 8th century or the equally dramatic fall in the middle of that century, for that is commonly seen, but it is the failure of the finds to pick up again in the 10th century that is notable and indicates that on all these sites human activity ceased or changed its character in the late 9th or early 10th century. The single-finds from some sites in the Low Countries yield similar results when analysed in this way (Blackburn 1993).

In Scandinavia there are now quite a number of individual sites that have yielded a significant quantity of Viking-period coins, including Helgö, Birka, Uppåkra, Paviken, Häffinds, Kaupang, Tissø, Vester Egesborg, Gudme and Hedeby, though of these only Helgö and Birka have been adequately published (Hoven 1986; Rispling 2004a). Trying to establish the "normal pattern" of coin-loss for Scandinavia is more difficult than for England, since isolated finds from the countryside are scarcer. There is also a concern that apparent single finds may be strays from a disturbed hoard, particularly ones found on Gotland, and grave finds should if possible be excluded from a statistical sample as they will not have been accidental losses. Even so, in the last 20 years there has been a substantial increase in the number of Islamic single finds from Denmark due to the use of metal detectors by amateurs; their use is more restricted in Sweden. Bornholm and Zealand, in particular, have seen a substantial rise in the number of finds. New finds from Denmark up to 1989 had been published by



Kromann (1985, 1990), listing 25 Islamic single finds. Recently, von Heijne (2004) has provided a catalogue of all hoards and single finds of the Viking Period from Southern Scandinavia, i.e. Denmark and the southern Swedish provinces of Skåne, Blekinge and Halland, and from this it is possible to establish a control sample, albeit one that is much smaller than that from England.

3.2.2 A sample of single finds from Southern Scandinavia

If one excludes the 224 dirhams from the prolific site of Uppåkra (Skåne), von Heijne lists some 265 single finds of Islamic coins in her catalogue (von Heijne 2004:199–376). However, this rather promising number is significantly reduced once one has removed 73 coins for which there is no identification beyond "Islamic dirham" and a further 90 which are effectively attributed only to a dynasty (Umayyad, Abbasid, Samanid) and not more. This leaves 102 coins that are closely identified and suitable to plot in a histogram. The main reason for the lack of good attributions is that many of these coins are recent finds that have still to be studied by a specialist, for Islamic coins, as already noted, are difficult to identify especially if merely fragments of a coin as many single finds are. For some years, since the death of Anne Kromann in 1996, the National Museum in Copenhagen has lacked such a specialist, but work in now underway by Gert Rispling to catch up with the backlog. The Bornholm finds, although the prolific, suffer particularly from a lack of attributions, with only 14 of the 103 coins closely identified. With further finds being made each year, and with specialist help, there is every prospect that the quality of the available data will improve dramatically. The finds from Skåne, although fewer in number, are the best recorded since many have been published in CNS 3.1 and 3.4 after careful study.

The finds, many of which have been discovered with metal detectors, are categorised by von Heijne as isolated finds and series finds, the latter when they

Figure 3.4 *Coin-finds from four English sites; dates reflect probable loss of finds (Blackburn 2003).*

were found in conjunction with other coins of any period or archaeological material. In analysing them I have found it more useful to group the finds according to the number of *Islamic* coins from the site (Tab. 3.3). Von Heijne does not record more than 20 Islamic coins from any one site, apart from Uppåkra, the largest of her groups being from Gudme (19 coins), Vester Egesborg (11), Tissø (10) and Sandegård (10). (More coins have since been found on these sites, but not as yet reported on, e.g. at Tissø there are now more than a hundred dirhams.) Ideally, these site finds should be excluded from our control sample, since they have a significant influence on the distribution of closely identified coins. Below I have therefore shown histograms with and without the finds from the 6–20 coin category, although in fact there is quite a close correlation between the two.

No. of Islamic coins from site	**No. of coins**	**Identified to dynasty**	**Closely identified**
1 coin	106 (40%)	75 (39%)	51 (50%)
2–5 coins	93 (35%)	62 (33%)	15 (15%)
6–20 coins	66 (25%)	55 (29%)	36 (35%)
	265	192	102

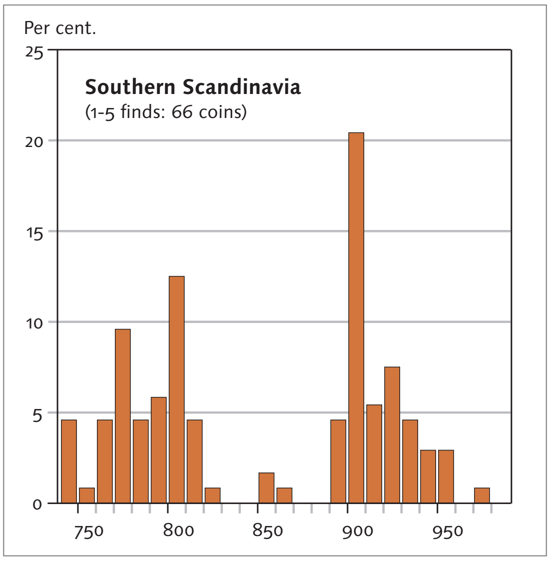
Table 3.3 *Division of Southern Scandinavian single finds by number from site*

Southern Scandinavia is a diverse area, with considerable regional economic differences between, for example, the Baltic island of Bornholm, the vibrant province of Skåne and westward-facing Jutland. Eventually, with sufficient finds, it would be appropriate to have separate control samples for each plotted as histograms, but that is impractical at present. However, even with the fairly small numbers currently available one can compare the broad chronological make-up of the finds regionally contrasting the pre-890 coins (essentially Umayyad and Abbasid issues) with the post-890 ones (mainly Samanid and Volga Bulghar issues). The results (Tab. 3.4) suggest that overall there are roughly equal numbers of pre- and post-890 coins in the sample of Southern Scandinavian single finds, and when divided regionally that pattern is broadly maintained, although with a slightly earlier bias in Skåne, Blekinge and Halland that probably is not statistically significant. Likewise the earlier bias reflected in the Jutland figures cannot be given much weight in view of the very small number of coins from that region. It should be noted that from Norway there are very few finds of dirhams, apart from those from Kaupang, that might be regarded as single finds accidentally lost from circulation. Skaare records only two from settlement sites (Skaare 1976:nos. 84 and 162), and there is a strong probability that many dirhams that lack information about their find circumstances come in fact from graves or dispersed hoards. It would not be useful, therefore, to amalgamate the Norwegian finds with the material catalogued by von Heijne.

	Coins pre-890	**Coins post-890**
Skåne, Blekinge, Halland	22 (56%)	17 (44%)
Zealand, Funen, other islands	36 (51%)	35 (49%)
Bornholm	33 (49%)	35 (51%)
Jutland	9 (64%)	5 (36%)
Total (all S. Scandinavia)	100 (52%)	92 (48%)

Table 3.4 *Comparison of single finds from four regions of Southern Scandinavia.*

If we plot the 66 closely identified coins from sites that have yielded 1–5 Islamic coins as a histogram (Fig. 3.5.a) we have a chronological distribution that arguably reflects the general trends for coin circulation in Southern Scandinavia. If the coins from the more prolific sites are added (Fig. 3.5.b), the result is still rather similar, the only discernable differences coming in the relative proportions of early Abbasid coins. The general shape of these histograms is one familiar from other distributions based on site finds and hoards, with peaks in the decades of the 770s, 800s and 900s, and troughs after c. 820 and c. 870. What this “standard” single find distribution should provide is an objective assessment of the relative abundance of coins across the whole period. Armed with this, later in the chapter we will compare it with patterns shown by finds from Kaupang and other major Scandinavian sites.



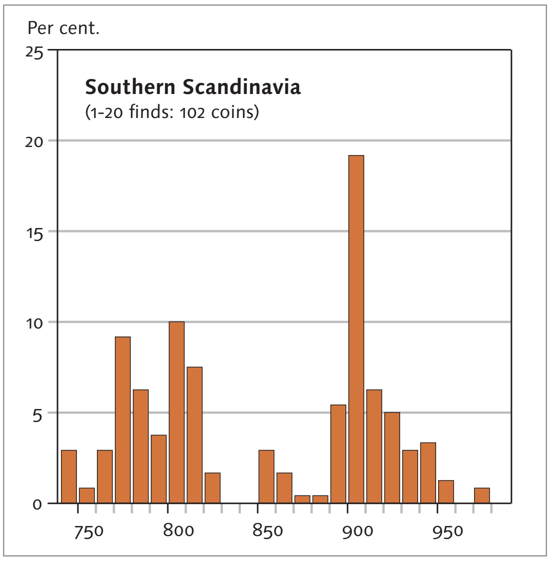


Figure 3.5 *Single finds of dirhams from Southern Scandinavia (per cent): **a**: sites with 1–5 dirhams; **b**: sites with 1–20 dirhams; by date of production.*

3.2.3 Date of production versus date of loss

When charting and interpreting single or site finds it is important to be clear what exactly it is one is plotting – the date of production or the date of loss. What numismatists normally call the "date of a coin" is the date it was struck, but what archaeologists or monetary historians are usually more interested in is the date on which the coin was lost, for this is when it is evidence of circulation. With a hoard there is internal evidence from its composition – in particular its age-structure and the date of its latest coin – from which to estimate its date of deposition, but single finds carry no such marker, so other means have to be sought. Our approach to this depends on the nature of the local economy.

In a coin economy, such as that of Carolingian Francia or Anglo-Saxon England, where the state produced its own coinage and regulated its use, it is relatively straightforward to estimate the likely date of loss. Coins often circulated for a limited duration before being officially reminted or driven out of circulation by economic forces, and these periods can be deduced from a study of coin hoards. The date of a coin's loss is limited by its date of production and the end of its normal circulation period, which in a regulated coin economy was often quite short – ten or twenty years was not unusual. In the histograms of English finds illustrated above (Figs. 3.3–3.4) the data have been adjusted to take account of this and they are intended to represent the probable dates of loss (Blackburn 1989a:19, 2003:21).

In bullion or money-weight economies, such as that in Scandinavia, estimating a coin's date of loss is much more complicated as such economies will usually be based on foreign coinage imported into the region and periods of circulation may be long. With an imported coinage the production date does not indicate when that coin began circulating in Scandinavia, for it may have arrived many decades later in mixed consignments of new and old coins. It is the pattern of importation into Scandinavia, and more specifically into the locality, that is significant. Without local recoinages or changes in weight-standard or fineness to drive the coins out of use, circulation periods in bullion economies were often quite extended. Changes came about instead as a result of continual wastage from the currency – for example, through being melted down to turn the coins into silver ornaments or ingots and through export, hoarding and loss. The hoards demonstrate the effects of these processes in Scandinavia, and the composition of the currency changed decade by decade. These changes will have been strongly influenced by the wastage rate, but there may have been another factor at work, namely variations in the size of the currency. If, for example, there had been a large influx of newly imported coins substantially increasing the volume of coinage, the composition of the currency would have changed even if there had been no wastage. In

Hoard	T.p.q.	No. of dirhams	Whole coins %	Pre-895 dirhams no.	%
Lilla Väller (Lilla Veller), Roma, Gotland (CNS 1.22.3 (web publication))	907	55	47%	26	47%
Over Randlev, Jutland (Skovmand 1942:IIA.13)	910	234 (229 classified)	?	109	48%
Bote, Alskog, Gotland (Östergren 1989)	912	99	?	30?	30%
Neble, Zealand (Kromann 1990:no. 15)	921	23	17%	2	9%
Sigerslevøster, Zealand (von Heijne 2004:no. 4.18)	921	51	78%	13?	25%
Bräke, Brunnby, Skane (CNS 3.1.12)	924	127 (110 classified)	51%	10	9%
Bora, Fårö, Gotland (CNS 1.4.5)	932	99 (94 classified)	51%	0	0%
Båta, Fårö, Gotland (CNS 1.4.4)	940	208 (206 classified)	49%	4	2%
Utoje, Fleringe, Gotland (CNS 1.4.10)	942	465 (432 classified)	77%	25	6%
Tänglings, Etelhem, Gotland (CNS 1.3.37)	945	314	73%	20	6%
Terslev, Zealand (Skovmand 1942:IIA 45)	949	1702 (1202 classified)	25%	147	12%
Gjerrild, Jutland (Kromann 1990:no. 13)	953	75 (67 classified)	3%	3	4%
Erikstorp, Östergötland (CNS 8.1.12)	956	296 (214 classified)	93%	2	1%

Table 3.5 Some 10th-century hoards from Denmark, mainland Sweden and Gotland, showing their pre-895 content.

practice there will have been fluctuations in all three factors – rate of coin import, rate of wastage and size of the currency – each affecting the composition of the currency at any particular moment.

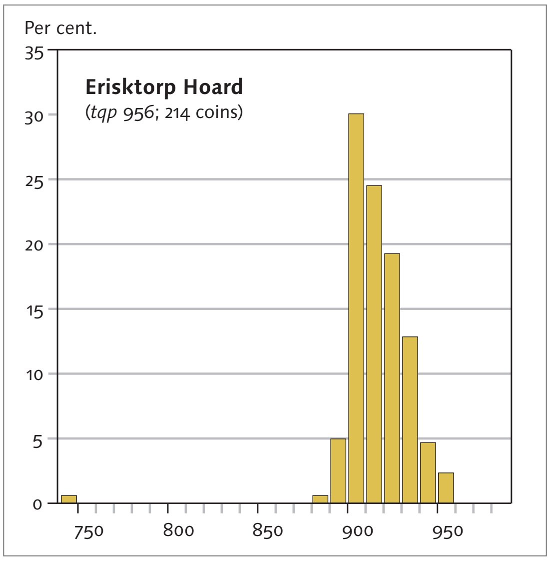
There are two periods when quite radical changes in the composition of Scandinavian hoards can be seen over the course of a few decades. In both cases there appears to have been a reduction in the rate of importation of new coinage followed by a substantial increase conveniently marked by distinctive coin types. The first came in the late 9th and early 10th century with the arrival of Samanid dirhams, and the second was during the last third of the 10th century as Islamic dirhams were replaced by West European pennies. Studying these two transitions may provide insights into what was happening in the Scandinavian economy at other times. The former is directly relevant to the interpretation of the Kaupang finds and deserves further exploration here.

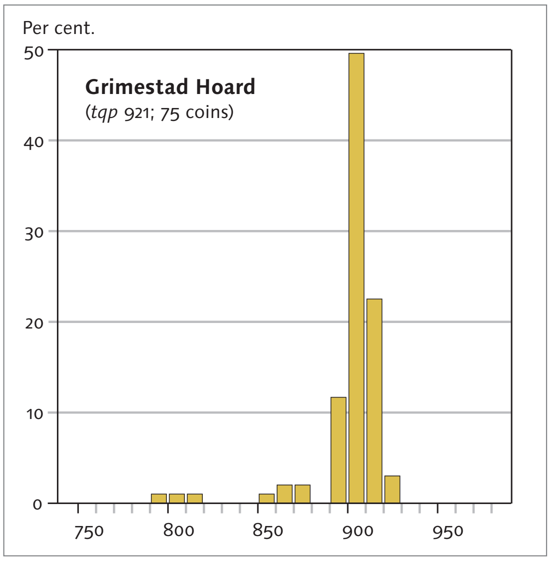
3.2.4 Changes in the currency in the early 10th century

In the first quarter of the 10th century to judge from the coin hoards there was a radical change in the composition of the currency in Scandinavia generally. The number of newly minted Abbasid dirhams arriving in Russia and the Ukraine, from the central areas of the Caliphate – modern Iraq and Iran – and further east, declined significantly in the 870s, and almost ceased in the 880s. What effect this had on the rate of flow of dirhams into Scandinavia from the intermediate regions of Eastern Europe is uncertain – there is no obvious way of measuring this – but it would seem very likely that a disruption in the supply of bullion at one end of the chain would have had an effect along the whole route. At least we can say that the composition of the currency in Scandinavia had changed significantly by the end of the 9th century, with the vast majority of coins being more than 30 years old.

Soon after this a new wave of imported dirhams began to arrive in Russia and Scandinavia, produced by the Samanids, an independent dynasty ruling in Central Asia with their capital based at Bukhara (Uzbekistan). Their first coins in Scandinavia date from the mid-890s and probably arrived around 900. These new coins, mainly Samanid ones and Volga Bulghar imitations of them, came to dominate the Scandinavian hoards and those from the Northern Lands generally within two or three decades. Table 3.5 shows 13 hoards of the 10th century from Denmark, mainland Sweden and Gotland that demonstrate this point. (Dirhams could travel quite swiftly from the Caliphate, and they can appear in Scandinavian hoards within a few years of their production. In interpreting the Scandinavian hoards I have assumed that they were deposited five to ten years after the t.p.q. of the latest dirham, which is a convenient approximation, although for smaller hoards and periods when new coins were scarce the deposition date may have been later.) Thus in the Over Randlev hoard from Jutland, with a t.p.q. of 910 and probably deposited c. 915–920, over half the coins (52%) were of the new types, while by the later 920s that proportion had risen to 85% or more. The hoards from Gotland tell a similar story.

Individual hoards vary in composition because of the way in which they were assembled, in particular the extent to which they may have drawn on earlier stores of wealth or may represent bullion recently





arrived in Scandinavia, rather than gathered locally in transactions. People will also have decided whether to select whole coins or larger fragments in preference to smaller pieces in circulation for hoarding. Contrast, for example, the two youngest hoards in Table 3.5, for whereas the Gjerrild hoard is almost entirely fragments, the Erikstorp hoard is essentially composed of whole coins. The former looks like a purse of current money while the latter was probably selected for longer-term storage as it included beads and female ornaments, and yet interestingly there is no significant difference in their pre-895 composition. By c. 960 it would appear there were very few pre-Samanid coins to be found (Fig. 3.6).

The Norwegian finds of the 10th century exhibit a similar pattern (Tab. 3.6), though with even fewer Abbasid coins perhaps because the hoards tend to have a higher proportion of whole dirhams. In theory such selection might have given preference to newer coins that had had less opportunity to be divided in transactions, although as we shall see (sec. 3.2.6) it is not evident that older coins were more fragmented. In the largest of the Norwegian hoards of the 920s, that from Grimestad, the pre-895 dirhams constituted only 10% of the 77 coins in the hoard (Holst 1936; Fig. 3.7). The slightly later finds from Voie and Herten contained no pre-895 dirhams, while the Teisen hoard, with a revised t.p.q. of 932, had 18 pre-895 dirhams amounting to 29% of the coins. This looks atypically high, and out of character with the other Norwegian hoards, suggesting that Teisen had a distinctive history behind its formation. After this the Norwegian hoards contain virtually no pre-Samanid dirhams at all.

The evidence of these hoards would imply that the proportion of pre-895 coins in the currency of Norway around 930 was about 10%, which suggests that within 30 years 90% of the pre-existing currency had been replaced by newly imported coins. But does this mean that there was a particularly high wastage during the first quarter of the 10th century, or was the new wave of imported mainly Samanid coins on such a vast scale that the earlier issues were simply swamped? A combination of wastage plus growth is perhaps likely. If only we knew how the volume of coinage in circulation had changed between the 890s and 920s, and in what proportion, we could begin to estimate the wastage rate at that period.

Hoard	T.p.q.	No. of dirhams	Whole coins %	Pre-895 dirhams No.	Pre-895 dirhams %
Grimestad, Vestfold (Skaare 1976:no. 43)	921	77	86%	8	10%
Voie, Aust-Agder (Skaare 1976:no. 62)	926	12–13? (9 classified)	100%	0	0%
Herten, Nordland (Skaare 1976:no. 169)	928	18	78%	0	0%
Teisen, Oslo (Skaare 1976:no. 12; Khazaei 2001:102)	932	63	29%	18	29%
Rönnvik, Nordland (Skaare 1976:no. 171)	949	39 (32 classified)	3%	1	3%
Holtan, Sør- Trøndelag (Skaare 1976:no. 140)	950	65 (64 classified)	95%	0	0%
Tråen, Buskerud (Skaare 1976:no. 36)	991	11	82%	0	0%

Table 3.6 *The main Norwegian hoards of Islamic coins and their pre-895 dirhams (after Skaare 1976:tab. 12).*

Figure 3.6 *Composition of the Erikstorp (Östergötland) hoard (per cent).*

Figure 3.7 *Composition of the Grimestad (Vestfold) hoard (per cent).*

How rapidly did the change in composition of the currency spread across Scandinavia during the first quarter of the 10th century? Most of the coin hoards from this period have been found on Gotland and they show that Samanid dirhams quite soon came to form a major component in the currency, representing around 50% in hoards with t.p.q.'s of 906–908, often rising to 80% or more in hoards with t.p.q.'s after 915 (Tab. 3.5; Kilger, this vol. Ch. 7:236 and Tab. 7.12). From mainland Sweden, Denmark and Norway there are far fewer hoards with t.p.q.'s before 920 (Tab. 3.5–3.6; Kilger, this vol. Ch. 7:236, Tab. 7.13), and then, at most, one per region so that one cannot trace independently the development of the currency in each area. However, these hoards generally have compositions comparable with hoards of similar date from Gotland. There are individual exceptions in both groups that have anomalously different compositions, but, as explained above, some hoards with different histories are to be expected, and it is legitimate to focus on those that show a consistent pattern.

I can find no evidence to indicate that the diffusion of the new Samanid coins did not occur fairly quickly within Southern Scandinavia, and the fact that there is not a hoard from a particular region in this period does not mean that Samanid coins were not present there. One is struck, for example, by the speed with which dirhams could move on from Scandinavia to England and Ireland, and occur in a series of hoards deposited between c. 905 and c. 925 (Blackburn and Pagan 1986:nos. 87–8, 90–5, 97 and 101; Naismith 2005:tab. 1). Kilger (this vol. Ch. 7:235–8) takes a different interpretation, and argues that there was considerable regional variation in the composition of the currency before the 920s. He appears to rely on negative evidence, assuming that if no hoard has been found in a region then newly minted dirhams had not reached there, though earlier coins may have continued to circulate. Thus he argues that the Grimestad hoard shows that Samanid dirhams reached the area around Kaupang at the earliest in the 920s (Kilger, this vol. Ch. 7:237). Yet, as discussed above (3.2), the presence or absence of hoards and their size cannot be taken as an indication of the amount of coinage available in a locality.

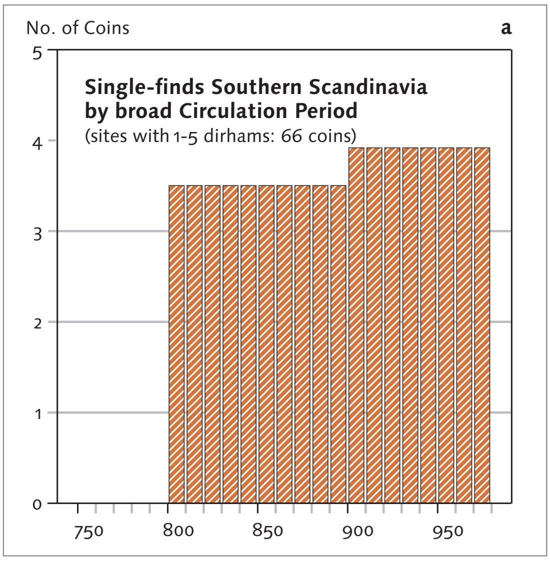
In the absence of local evidence to the contrary (e.g. hoards with a different age-structure), it is reasonable to assume that the composition of the currency was similar to that of other regions. Taking a broad view of the 10th-century hoards, and allowing 5–10 years after the t.p.q. as the date of deposit, one can arrive at an estimate of the composition of the currency decade by decade that will be adequate for the interpretation of the site finds (Tab. 3.7). Since, with the exception of Uppåkra, the sample of finds from any of the Scandinavian sites is really quite small when analysed by decades, some degree of regional or chronological fluctuation from this norm is unlikely to change the interpretation of the finds significantly.

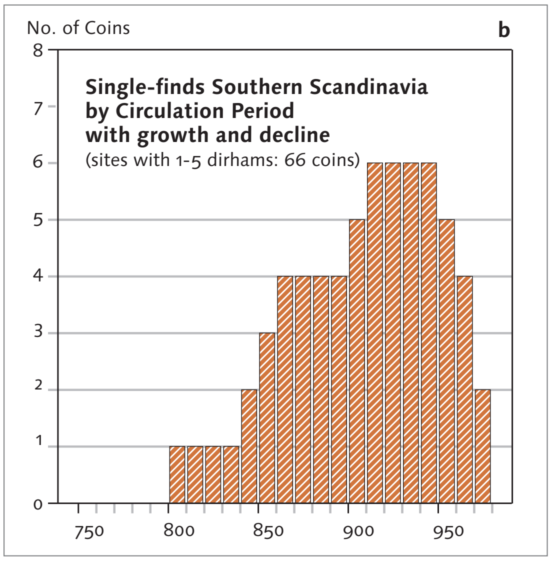
Decade	Proportion of pre-890 dirhams
890–900	100%
900–910	90%
910–920	50%
920–930	20%
930–940	10%
940–950	5%
950–960	5%
960–970	2%
970–980	0%

Table 3.7 *Typical composition of the coinage circulating in Scandinavia as reflected by hoards (approximate percentage estimated at the middle of each decade, i.e. in 895, 905 etc.).*

3.2.5 Considering changes in the size of the coin-stock and the wastage rate

One approach to tracking changes in the volume of the coin-stock could be through the single finds. An increase in the volume of coinage in active use should lead to a rise in the rate of accidental coin-loss, which would be visible in the finds (Blackburn 1989b). For England it has been argued that the pattern shown by the histogram of isolated finds reflects variations in the size of the general currency, and the same could in theory be applied to Scandinavia. Admittedly, the sample of finds from Southern Scandinavia is much smaller and less secure than the equivalent from England, but it may be helpful to explore the technique with these data to give us an insight into whether the size of the currency in circulation after c. 900 was





broadly similar in scale or dramatically larger than it had been in preceding decades. Any conclusions reached can only be very tentative, but may serve to stimulate debate and further investigation of this question.

The histogram of Southern Scandinavian single finds (Fig. 3.5) plots them according to their date of production, but it is their date of loss that we need to represent in order to relate it to the size of the currency. As we know that very few if any dirhams arrived before 800, the earlier coins in the sample must have been lost after that. We have also seen that c. 900 forms another significant watershed, as the first Samanid dirhams would have appeared in the currency and by c. 920 they had probably become the largest element. In Figure 3.8.a the finds have been grouped into two broad circulation periods – c. 800–900 and c. 900–980 – crudely assuming an equal loss throughout the period. Thus the 35 coins dated before 890 are treated as being lost before 900, and the 31 post-890 coins as being lost after 900. This is a gross over-simplification, but it represents a first step towards a more refined estimate of a possible pattern of coin-loss in Southern Scandinavia. Figure 3.8.b takes the same approach, but allows for some of the pre-890 coins to have been lost after 900, and provides for a gradual growth in the first half of the 9th century and a decline in the mid-10th. Nine of the 35 pre-890 coins are treated as being lost after 900 – reflecting the composition of the currency implied by the 10th-century hoards (Tab. 3.7). This model is very much an approximation, for we are guessing the rate of growth and decline at the start and end of the period, and do not know whether the coin-stock dipped at the end of the 9th century with the virtual absence of newly minted coin coming from the Caliphate. Whatever further adjustments one might make to the heights of particular columns before and after the watershed of 900, the final pattern is likely to suggest that there was some modest growth in the rate of coin-loss after 900, but not such that might suggest a two-fold or three-fold increase in the size of the currency. As we shall see later in this chapter, the site finds from individual prolific sites vary considerably in their compositions, but they nonetheless fall into a similar range and support the general conclusions suggested by this sample of Southern Scandinavian single finds.

Tentative as these results may be, it is interesting to explore their implications for the annual rate of wastage in the early 10th century. If there was no significant increase in the volume of coinage in circulation between the 890s and 920s, and by the late 920s only 10% of the pre-Samanid issues were still current, this would imply an astonishingly high wastage rate of almost 7.5% per annum over 30 years (the compound rate required to erode the value by 90%). Even if the size of the currency had doubled in that period the wastage rate would still be over 5% per annum. Such rates are exceptionally high. If we were more conservative and said that 20% of pre-Samanid dirhams still survived in the late 920s the comparable wastage rates would be 5% and 3%. We should accept the higher rates as more probable, bearing in mind that the coinage being imported into Scandinavia via Eastern Europe was not purely in new coin but would have been in a mixture of old and new. Some of this loss would have gone into the deposit of hoards, and some into exports, but a large proportion of the older dirhams would probably have been melted down to make ornaments and ingots. This could explain why the silver hoards of the 9th and earlier 10th centuries are replete with Scandinavian silver bullion. If such rates of wastage were normal for this period it would imply that a coin would have remained in the general bullion stock, on average, for only about 15 years, and that the entire currency had been effectively renewed within 40–50 years.

Figure 3.8 *Single finds of dirhams from Southern Scandinavia (66 coins) adjusted to reflect date of loss:* ***a:*** *by broad circulation period;* ***b:*** *by circulation period adjusted to reflect growth and decline.*

3.2.6 Are the hoards representative of the local currency?

To what extent can we rely on the hoards as evidence of the composition of the currency in active circulation, and can we use this as a means of dating the loss of coins on a particular site? These questions are pertinent in a Scandinavian context because it has been suggested that there is a degree conflict in the evidence presented by the 10th-century dirham hoards and by the finds from archaeologically dated contexts at Birka. To resolve this conflict some scholars have postulated that there were two strata of currency: that in active use in trading settlements such as Birka and that from which hoards were derived (Callmer 1980; Gustin 2004b; see also the discussion by Kilger, this vol. Ch 7:206). Is this justified?

As a general principle, experience from different periods, ancient to modern, and different parts of the world shows that most coin hoards were assembled from money in local circulation, although a minority had a more complicated origin, for example, representing money brought from elsewhere, or savings that had been built up over a number of years. While there are risks involved in relying on individual isolated hoards, where there are a number of hoards with comparable compositions it is reasonable to suppose that they were drawn from local circulation. The hypothesis that in one location or region there were two separate pools of currency from which hoards and site finds were drawn involves special pleading and would require strong evidence to substantiate.

The contents of hoards may, nonetheless, have been subject to some selection, typically towards higher value coins more appropriate for hoarding. In coin economies it is common for the smallest denominations to be excluded from hoards, on the grounds that they are not convenient for long-term savings. Thus among 164 English hoards of the late 12th and 13th centuries, 99% of the coins were pennies and only 1% were of the two smaller denominations (halfpennies and farthings), whereas among single finds and site finds these are the most common coins (Allen 2002:26; Allen and Doolan 2002:87–8). By contrast, single finds may be biased in favour of smaller coins of lower value, which changed hands more often and were easier and less painful for their owners to loose. Hoards and single finds may be drawn from the same stock of currency, but have different compositions. By anticipating the factors likely to be involved in any selection or bias, we may understand the relationship of the finds to the currency originally in circulation.

The hoards deposited in Scandinavia during the 9th and 10th centuries are reasonably consistent. As we have seen, those deposited in the 920s (i.e. with t.p.q.'s after c. 915) generally contain at least 80% Samanid-period coins, increasing to around 95% by the 950s. This degree of consistency in itself suggests that the hoards reflect local circumstances and that relatively few of them have had their contents distorted by substantial elements that are either older or drawn from freshly imported coinage with a different composition. Moreover, the fact that the hoards from Denmark and Skåne (Bräke, Terslev and Gjerrild), in particular, contained substantial quantities of hacksilver, which Hårdh (1996:91) believes was locally produced, also suggests that the coinage element was drawn essentially from the local mixed bullion stock. This point is significant.

Even so, in assembling a hoard it is likely that many of their Scandinavian owners will to some extent have selected particular material for saving. There is no reason to think that they would have selected Samanid coins in preference to Abbasid ones, even if they were aware of the differences. However, it is reasonable to expect some owners would have preferred to store whole dirhams or larger fragments in preference to small pieces, and indeed one sees in Tables 3.5 and 3.6 significant variations in the percentage of whole coins in the various hoards. We must be alert to the fact that in some hoards smaller fragments may have been present but not recovered from the ground, or if they were they may not have been recorded or preserved. In contrast, site finds are usually very finely divided, as at Birka where 70% of the finds from the 1990–1995 excavations were less than a quarter of a coin (Rispling 2004a:35, 43–56), or at Torksey where 88% of a sample of 68 coins were smaller than a quarter (below sec. 3.5). Some coins were imported into Scandinavia in a fragmented state, but if, as is sometimes argued, further fragmentation took place in the course of their use, then it would follow that older coins ought to be more finely divided. In that case hoards which contain whole coins or large fragments could be expected to have a higher proportion of more recent coins than would

Hoard	T.p.q.	Pre-895 No. of coins	Pre-895 No. whole	Post-895 No. of coins	Post-895 No. whole
Grimestad, Norway	921	8	6 (75%)	69	62 (90%)
Bräke, Skane	924	10	4 (40%)	100	50 (50%)
Utoje, Gotland	942	25	21 (84%)	407	306 (75%)
Tänglings, Gotland	945	20	18 (90%)	294	210 (71%)

Table 3.8 *A comparison of the percentage of whole coins among pre- and post-895 dirhams in four hoards.*

	Häffinds, Gotland				Gjerrild, Jutland			
	Coins	Whole	>¼	<¼	Coins	Whole	>¼	<¼
Abbasids etc., before 892	23	52%	43%	4%	3	-	33%	67%
Isma'il bin Ahman (892–907)	308	68%	29%	3%	-	-	-	-
Ahmad bin Isma'il (907–914)	212	69%	29%	2%	2	-	50%	50%
Nasr bin Ahmad (914–943)	527	51%	41%	7%	10	10%	40%	50%
Nuh bin Nasr (943–954)	106	47%	47%	6%	9	11%	22%	67%
Abd al-Malik bin Nuh (954–961)	8	62%	38%	-	-	-	-	-

Table 3.9 *The degree of fragmentation by ruler in two hoards: Häffinds, Burs, Gotland (t.p.q. 957; CNS 1.4.29); Gjerrild, Jutland, Denmark (t.p.q. 953; Kromann 1990:no. 13).*

be found among the small fragments that were typically lost on settlement sites.

To test this theory one might look at the age-structures of whole coins and fragments in some of those hoards in Tables 3.5 and 3.6 for which adequate data are available (Tab. 3.8). In the two earlier hoards, Grimestad and Bräke, the proportion of whole coins is lower among the pre-895 dirhams, although the number of coins is small and so statistically less reliable. In the two later hoards, however, the proportion of whole coins is actually higher among the pre-895 dirhams than among the post-895 ones. One cannot conclude from these figures that the older coins in the hoards were consistently more fragmented; indeed the two later and larger hoards suggest the opposite.

With a second group of hoards it is possible to investigate changes in the degree of fragmentation between different 10th-century Samanid rulers. The 1975 Häffinds (Gotland) hoard is an archaeologically excavated and well-published hoard of 1,452 dirhams (t.p.q. 957; Tab. 3.9). It is evident that while the proportions of whole and fragmented coins in this hoard varies to some extent from reign to reign, there is not a progressive increase in the degree of fragmentation with age. Indeed the trend is rather the opposite, for the more recent coins of Nuh and Nasr are more fragmented than those of Ahmad and Isma'il, which were 40 or 50 years old when the hoard was deposited, and even the much earlier Abbasid issues were no more fragmented than the recent issues. A very similar result is obtained if one analyses the hoard from Broa, Fårö, Gotland (t.p.q. 932; CNS 1.4.5). This may imply that the dirhams were already partially fragmented on arrival in Gotland and suffered little further division on the island. The position could have been different in Southern Scandinavia, if there was a local practice of dividing coins. Table 3.9 analyses another hoard, that from Gjerrild, Jutland (t.p.q. 953), which is composed almost entirely of fragments, including many small ones, and to that extent it replicates the site finds. Although the numbers are small, they show similar results to the two Gotland hoards, in that the degree of fragmentation does not increase the older the coins are. As more hoards are recorded and published in detail it should be possible to test these observations further.

To summarise, while every hoard has its own history of the way and the purpose for which it was put together, perhaps influencing the size of the pieces hoarded, there are indications from the broad consistency of Scandinavian hoards and the inclusion of local hacksilver that they were mainly assembled from a common local stock of currency. Although in most hoards, as recorded, the proportion of finely fragmented coins is smaller than normally occurs among single finds, from a very limited survey of a few well-published hoards, there is no evidence that older coins in hoards are significantly more fragmented than younger ones. It follows that in circulation the age-structure of whole coins should have been similar to the age-structure of smaller fragments, and therefore that the age-structure of hoards and of single finds lost at the same time and place ought also to be similar. In principle, then, it would appear to be reasonable to rely on evidence derived from hoards as a means of dating the period of loss of single finds on the productive sites.

Layer	Archaeological dating	Dirhams (AD dates)
XI	c. 850–900	712/13, 772/3, 759/60
X	c. 900	740/50, 747/8
VI–IX	c. 900–920	712/13, c. 740, 698–750, c. 770–780?, c. 800–870
I–II	Plough	743/4, 874/5, 880/1, 900–920?, 914/15, 913–923, 922/3, 946/7

Table 3.10 *Coins from Birka Harbour excavations (source: Welin 1973; Kyhlberg 1973a; Björn Ambrosiani pers. comm.).*

3.2.7 Is the archaeological evidence from Birka inconsistent with the hoard evidence?

It has been suggested that the site finds and the grave finds from Birka in the 10th century show very different compositions from those of contemporary hoards (Kyhlberg 1973a; Callmer 1980; Gustin 2004b). It is argued that they contain a higher proportion of pre-890 coins than is found in the hoards, and that the hoards are not representative of the sort of coinage that was in use in the settlement of Birka. This section will look in some detail at the finds from stratified contexts in Birka's settlement and harbour sites. It has been beyond the scope of this report to investigate the graves further. However, it is worth noting that grave finds are rather different from single finds as they were deliberately selected for inclusion in the grave, and the coins had often been converted into jewellery, perhaps many years earlier.

Birka was a trading place and settlement on Lake Mälaren that flourished from the mid-8th century until c. 970. Over a thousand Viking-period coins have been found at Birka, including four hoards containing some 600 coins, more than 230 coins from graves, and many stray finds (summarised in Wiséhn 1989:nos. 3–35). Three substantial excavation projects in recent decades have yielded coins which can reasonably be treated as single finds, although the possibility of their including small dispersed hoards cannot be ruled out. From excavations around a jetty in the former harbour in 1970–1971 there were found 18 dirham-fragments, which were promptly published by Welin (1973; Wiséhn 1989:no. 30). Investigations in 1988 of a house terrace by the town ramparts produced 49 dirhams, of which 29 could be closely dated (Holmquist Olausson 1993:112–15, based on attributions by Gert Rispling; Wiséhn 1989:no. 29A). Only one coin was whole and the remaining 48 were fragments. Still more recently, excavations in the Black Earth of one settlement plot and part of an adjoining lane during 1990–1995 produced 76 single finds (68 dirhams (including five imitations in copper, three silver blanks and three unidentified dirhams), one gilt-copper imitation of an Islamic gold dinar, one Nordic, one Roman, and one (plus four?) Byzantine coins) and two small hoards containing five and 21 dirhams (Rispling 2004a; Gustin 2004b). The three Birka sites could hardly be more different one from another. In each case they include coins from stratified layers with datings that might appear to question the view that pre-890 coins quickly diminished in circulation in the 10th century, but do they?

The 18 coins from Birka Harbour have an extraordinary age-structure with a strong 8th-century element (57%), including no less than seven Umayyad (i.e. pre-750) and three early Abbasid coins (dated 750–780), and then a late 9th- and 10th-century element. All but one of the ten 8th-century coins, plus an unidentified Abbasid coin of c. 800–870, come from excavation layers VI–XI (Tab. 3.10). By contrast the finds from the ploughsoil (layers I–II) consist of the five Samanid and two late Abbasid coins of the 870s–880s, plus one Umayyad coin. This coin distribution might suggest an early-9th-century date for these stratified layers (VI–XI) and a 10th-century date for the disturbed layers (I–II) in the ploughsoil. However, the excavation results indicate that the Umayyad and early Abbasid coins were deposited during the period c. 850–920/30 around a jetty built into the harbour, with four of them associated with the latter part of that period, c. 900–920/30 (Kyhlberg 1973a and pers. comm. Björn Ambrosiani). The composition of these finds is bizarre by any standards. It is not the absence of post-890 coins from the c. 900–920 layers that is notable – among five finds one would only have expected one or at most two pre-890 coins, even if it were known that their loss was evenly distributed over the period – but it is the dominance of 8th-century dirhams in this and the earlier layers

Phase	Archaeological Date	No. of coins	Coin dates
B2	c. 780–810/20	1	778/9
B4	c. 840–850	2	750–820; 789–809
B6	c. 860/70–890/900	1	770/1
B6–7	c. 860/70–940	1	uncertain
B7	c. 890/900–940	6	698–750; 765–820; 819–892; 835–845; 844–869?; late B7: 938–943?
B7–8	c. 900–950/60	1	900–917
B8	c. 940–950/60	6 (+hoard)	776–782; 807/8; 908–914; 914; 926–932; 952/3; plus hoard (t.p.q. c. 939) and 2 Byzantine folles

Table 3.11 *Stratified coins from the Birka, Black Earth 1990–1995 excavations (source Rispling 2004a; archaeological dates Björn Ambrosiani pers. comm.).*

that is so remarkable. Among a typical group of ten coins deposited in the later 9th or early 10th century, one could expect there to have been five or six of the 9th century rather than the one that was present, and only one Umayyad rather than six. Their stratigraphy and distribution either side of the jetty argues against the ten 8th-century coins being from a disturbed hoard, but unless the archaeological interpretation is revised it is difficult to find any other explanation. The finds from Birka Harbour are really too anomalous for them to be relied upon as evidence for the composition of the currency in the later 9th or early 10th century.

The finds from the excavations of a building platform near the Town Ramparts have a more typical distribution comprising one Umayyad, 16 Abbasid and 12 Samanid or pseudo-Samanid coins among the 29 identifiable coins, the latest being one of 934/5. The building platform shows two phases of occupation, with a blank period between them. No coins are associated with the earlier (8th-century) phase. They all belong to the later layers L1 and L2 (Holmquist Olausson 1993:112), but the distribution between them is not indicated, and the layers are difficult to date (Gustin 2004b:100), for although they represent a sunken hut that clearly continued to be used into the mid-10th century, its starting date is not closely defined. Without a more detailed stratigraphy, we cannot tell when particular coins were lost. However, a group of this composition would not be inconsistent with a period of activity spanning the end of the 9th century and the first half of the 10th.

By contrast, the excavations of the Black Earth in 1990–1995 had an excellent stratigraphic sequence in eight phases running from the mid-8th to the mid-10th century. In these stratified layers 18 single finds of dirhams and one hoard with 21 coins were found (Tab. 3.11), while the remaining 50 dirham single finds and another hoard came from residual contexts or the ploughsoil. Dirhams were present from Phase B2 (late 8th/early 9th century) onwards, although in very small numbers until the 10th century: 13 or 14 of the coins were from the last two phases (B7 and B8) dating from c. 900 to the mid-10th century. The later of these two phases (B8, dated c. 940–950/60) yielded two Abbasid coins among six or seven single finds, which is more than one would expect based on hoard compositions, but in such a small sample this may not be significant. More to the point, five of the six or seven coins from Phase B7 (c. 890/900–940) pre-date 890, although one of these is very uncertain being described as a heavily corroded silver blank with no traces of minting, the tentative attribution to 844–869 being based on its fabric alone (Rispling 2004a:32 and 55, no. 99).

These five coins from Phase B7 appear to be the best evidence from Birka for the continued dominance of Abbasid coins in the earlier decades of the 10th century. Yet we need to pause and consider how they are to be interpreted. It would, of course, be too simplistic to suggest that they indicate the currency at Birka comprised three-quarters Abbasid to one-quarter Samanid dirhams throughout the period c. 890/900–940. If, on the other hand, we were to regard the six or seven coins of Phase B7 as having been lost at equal intervals over the 40 or 50 year period, compared with the losses one might predict from the changing compositions of Scandinavian hoards (Tab. 3.7), one could say that Abbasid coins are over-represented by one or two: i.e. we might have expected three or four rather than five Abbasid coins out of the six or seven. But we do not know that the losses were evenly spread, and if in fact they were a little more weighted towards the beginning than the end of the period, the composition of the finds from B7 could be in line with predictions based on the hoards. In any event, the sample is again too small for such variations to be statistically significant. In the

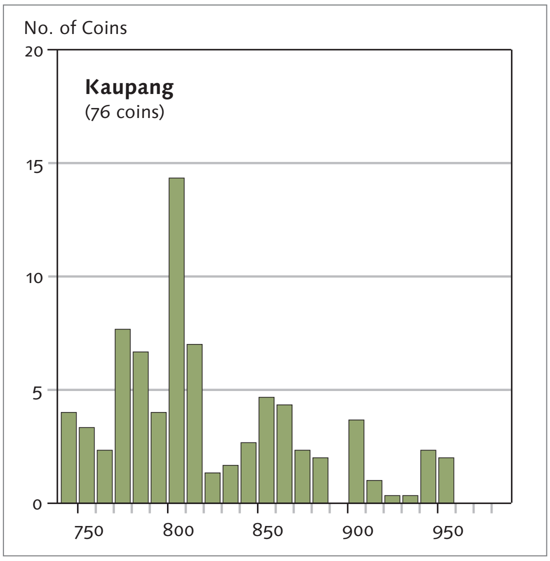


Figure 3.9 *Dirham finds from Kaupang, by date of production (all single finds; 76 coins).*

ploughsoil only seven of the 36 Islamic coins pre-date 890, showing a late bias, and Gustin (2004b:98) explains that the ploughsoil largely represents layers disturbed from the last decades of activity at Birka, i.e. c. 930–970.

In conclusion, the stratigraphic evidence from these three Birka sites is neither precise enough nor based on a sufficiently large sample for it to show that the currency circulating in Birka differed in composition from that inferred from hoards of the period generally. At the Birka Harbour site the proportions of pre- and post-890 coins are in line with predictions, although there is a preponderance of 8th-century coins that has not been satisfactorily explained. From the Town Ramparts building platform and the Black Earth 1990–1995 site the principal stratigraphic phase containing dirhams spans some four or five decades c. 890/900–c. 940 which saw a radical change in the age-structure of the currency, and without closer dating of the coin-losses within it one cannot tell whether they are consistent with the general hoard evidence or not. They neither prove nor disprove Callmer's hypothesis that the coinage circulating medium in the market place had a somewhat older profile.

3.3 The Kaupang finds: their significance for the chronology of the site

Turning now to the finds from the Kaupang settlement, the various elements among them – Islamic, Western, Roman, Byzantine – require separate treatment. The Islamic coins, although not the earliest, are the most numerous and important for dating, and they will be discussed first.

3.3.1 The Islamic dirhams

The nine datable coins from Blindheim's investigations at Kaupang were greatly enhanced by a further 67 among the new finds (plus two in the hoard), providing us with a sample of reasonable size. Only 14 fragments remain completely unidentified (plus an uncertain number in the hoard). Most of the new finds fall within a similar date range to the Blindheim finds, but significantly a few coins extend the range down to the mid-10th century, corroborating previous evidence from graves of activity continuing into the 10th century (Blindheim et al. 1999:141 and 187).

As we have already seen, none of the dirhams was found in an original context, and they can all be treated as coming from the medieval or modern ploughsoil, albeit from different parts of the settlement. For most of the discussion of chronology, therefore, it is reasonable to treat them as a body, omitting only the two hoard coins (No. 102) in drawing up the histogram (Fig. 3.9) which will form the basis for most of the discussion that follows. Although Rispling's attributions are detailed and authoritative – based on long experience working with dirham finds – because of their fragmentary nature, many of the coins can only be dated approximately, i.e. to within a bracket of several years or few decades, rather than to a specific year (for the method, see Rispling 2004a:35–8). In order to give weight to all the finds when preparing this and other histograms, I have allocated a proportion of the find to each year of the date bracket to which it is attributed, and then added up these fractions to calculate the number of finds per decade. Thus for coin No. 17, dated 750–764, I have given 10/15ths to the 750s and 4/15ths to the 760s. This process will have had a smoothing effect on the peaks and troughs, but it enables one to use a larger statistical base than would have been possible if only precisely dated coins had been included; indeed if one only took account of coins identified to a specific year none of the Scandinavian sites would have sufficient data to analyse. The same approach was adopted by Ilisch (1990) in analysing fragments in Near Eastern hoards. This his-

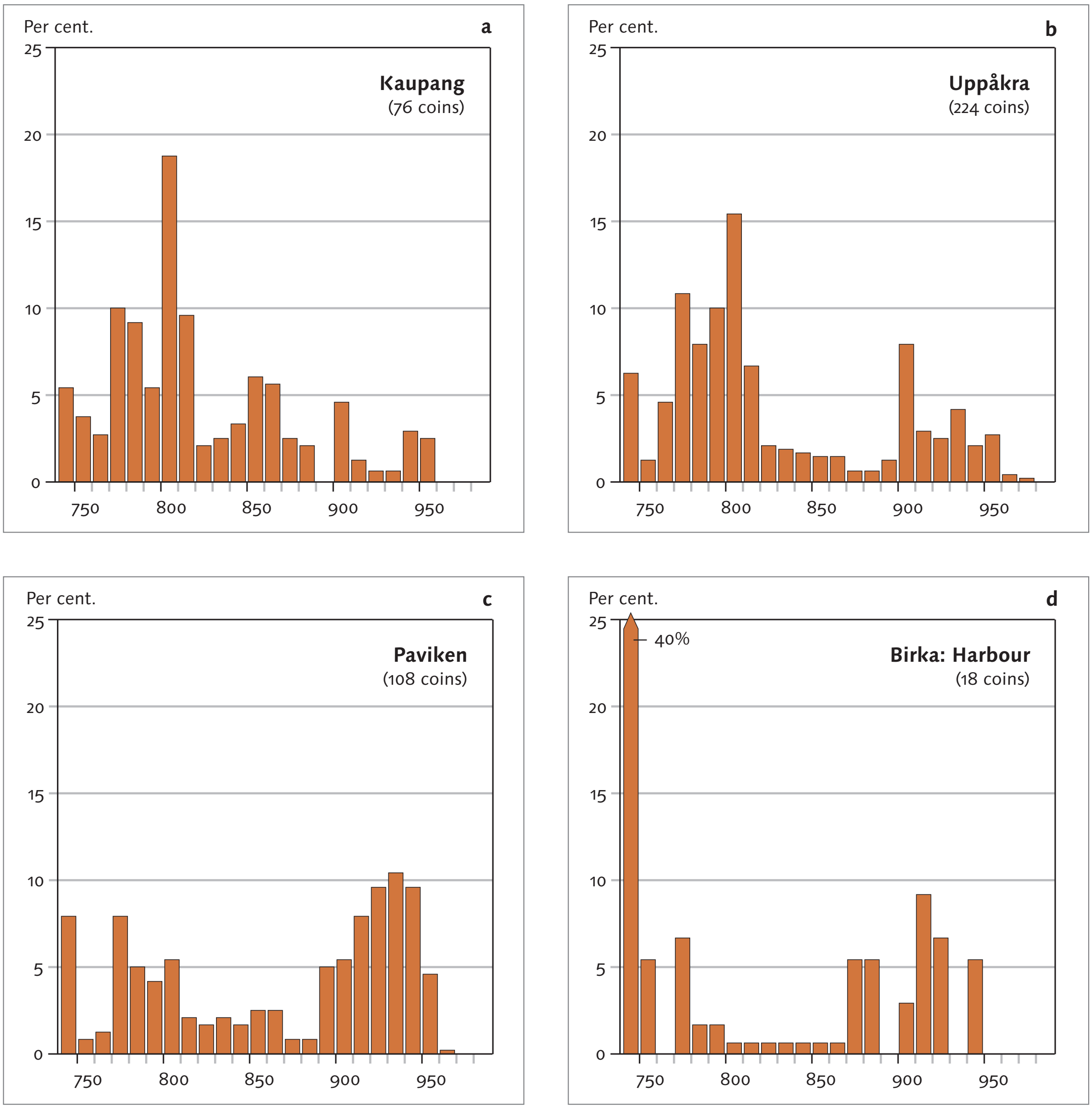


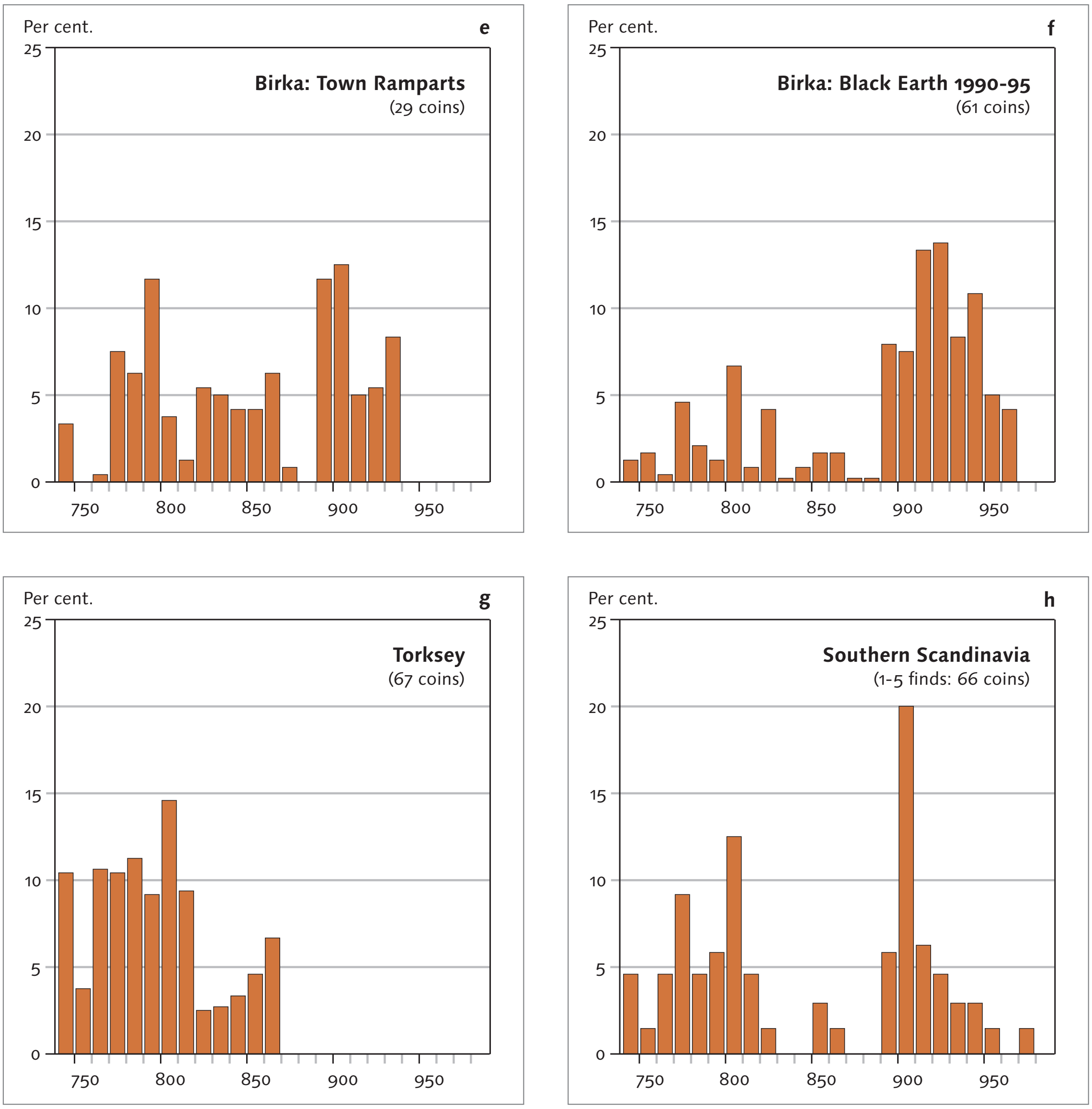
Figure 3.10 *Distribution of dirham finds from various sites (per cent), by date of production:* ***a:*** *Kaupang;* ***b:*** *Uppåkra;* ***c:*** *Paviken;* ***d:*** *Birka, Harbour;* ***e:*** *Birka, Town Ramparts;* ***f:*** *Birka Black Earth, 1990–1995;* ***g:*** *Torksey; and for comparison* ***h:*** *isolated finds from Southern Scandinavia. Note that the first interval on the charts represents all pre-750 coins.*

togram plots the coins by their date of production, but it will form the basis for a consideration of their likely date of loss.

Comparing the Kaupang dirhams with those from other Scandinavian sites

In considering the composition of the Kaupang dirham finds and their implications for the history of the settlement, we may start by drawing comparisons with the sample of single finds from Southern Scandinavia, developed above as a control, and with other prolific Scandinavian sites.

There are three settlements that have yielded significant numbers of dirhams as site finds and for which detailed coin lists have been available. Interestingly, each of these settlements, like Kaupang, had flourished during the Early Viking Period, but had gone into terminal decline by the end of the 10th century. A fourth site of Scandinavian character is in fact in the British Isles, at Torksey, Lincolnshire, and its



finds can be closely dated to the 870s.

The most prolific of the sites is Uppåkra, a remarkable Iron-age/Viking-period settlement in Skåne, some 5 km south of Lund. Investigations and excavations since 1996 have produced rich finds, including many Viking-period coins that have been studied by Kenneth Jonsson and Gert Rispling. They have kindly furnished me with a list of finds from Stora Uppåkra down to January 2003, which included 224 dirhams and a small number of Western coins (seven Carolingian, three 9th-century Nordic, and 12 German, English and Danish coins of the later 10th/11th centuries). The data drawn from this list are published here with their permission.

The second site is the small harbour and trading place at Paviken on the west coast of Gotland, from which 108 dirhams were recorded by Ulla Linder Welin in 1968–1971 (KMK Dnr 5882/68, 3313/69, and 1971 additions; I am grateful to Kenneth Jonsson for providing copies of these unpublished lists).

The third settlement used for comparison, Birka, has been discussed above (pp. 45–6). The find assemblages from the three modern excavations – Birka Harbour, a building platform by the Birka Town Ramparts and the 1990–1995 excavations of the Black Earth – each has a distinctive character, and it would be inappropriate to amalgamate them.

Torksey, a village on the River Trent, 15 km north-west of Lincoln, is recorded in the *Anglo-Saxon Chronicle* as being the location of the winter camp set up by the Scandinavian army in 872/3. Prolific finds discovered by metal-detector-users on several adjacent fields – coins, hacksilver and hack-gold, weights, and ornamental metalwork – have a distinctive Scandinavian character and their dating indicates that they are associated with this Viking camp, although as yet no archaeological investigation has taken place. A preliminary report on the site recorded 50 coins, including 11 dirham-fragments, the latest of which was dated 832–844 (Blackburn

2002). Recently, further finds have been reported to the Portable Antiquities Scheme which bring the number of coins to 172, including 68 dirhams, the latest of which is dated 866/7. (I am grateful to Rachael Atherton for recording the finds and Gert Rispling for identifying the dirhams.)

As one would expect, each of the sites has a distinctive distribution that reflects its own particular history, and the chronological differences are brought out in Table 3.12, which compares the proportions of pre- and post-890 coins among the finds. Kaupang is the most extreme or imbalanced of the Scandinavian sites, with 88% of its coins struck before 890 and only 12% after. This compares with broadly equal numbers of earlier and later coins in the sample of Southern Scandinavian single finds (53% : 47%). Paviken could be said to fall close to this standard range with 47% : 53%, while Uppåkra has a distinctly earlier distribution with 76% : 24%, though not as skewed as Kaupang's.

	Pre-890	Post-890
Kaupang	65 (88%)	9 (12%)
Southern Scandinavia	35 (53%)	31 (47%)
Uppåkra	171 (76%)	53 (24%)
Paviken	51 (47%)	58 (53%)
Birka Harbour	13 (72%)	5 (28%)
Birka Town Ramparts	17 (59%)	12 (41%)
Birka Black Earth 1990–1995	18 (30%)	43 (70%)
Torksey	68 (100%)	-

Table 3.12 *The proportions of pre- and post-890 dirhams at selected sites in Scandinavia and the Danelaw.*

	7th–8th cent.	9th cent.	10th cent.
Kaupang	36%	52%	12%
Uppåkra	42%	36%	22%

Table 3.13 *Kaupang and Uppåkra dirham finds compared by century.*

Figure 3.11 *Finds from Kaupang and Southern Scandinavia compared (per cent), by date of production.*

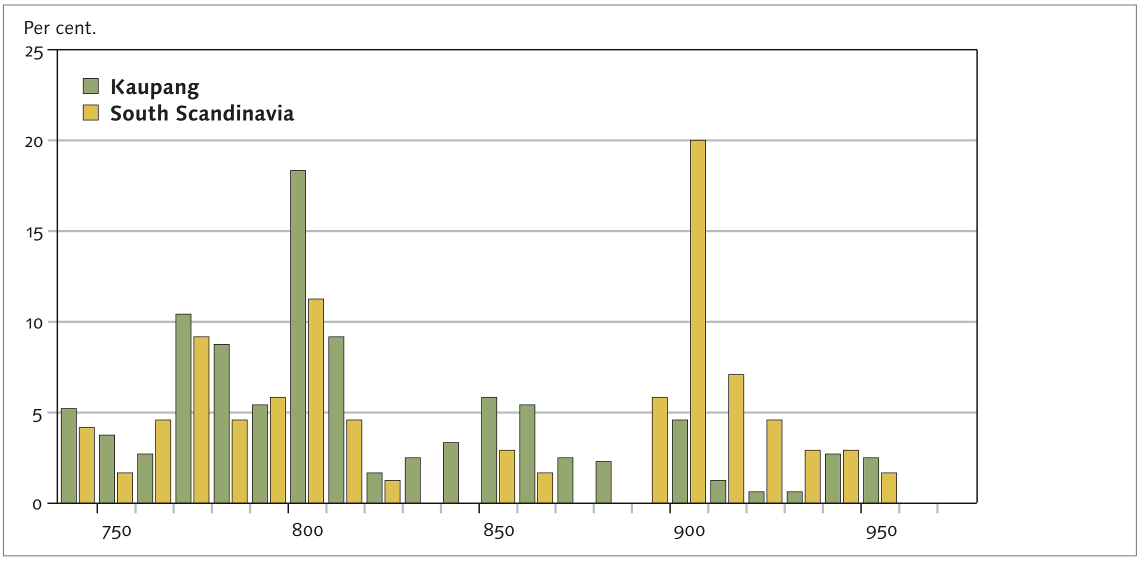
Figure 3.12 *Finds from Kaupang and Uppåkra compared (per cent), by date of production.*

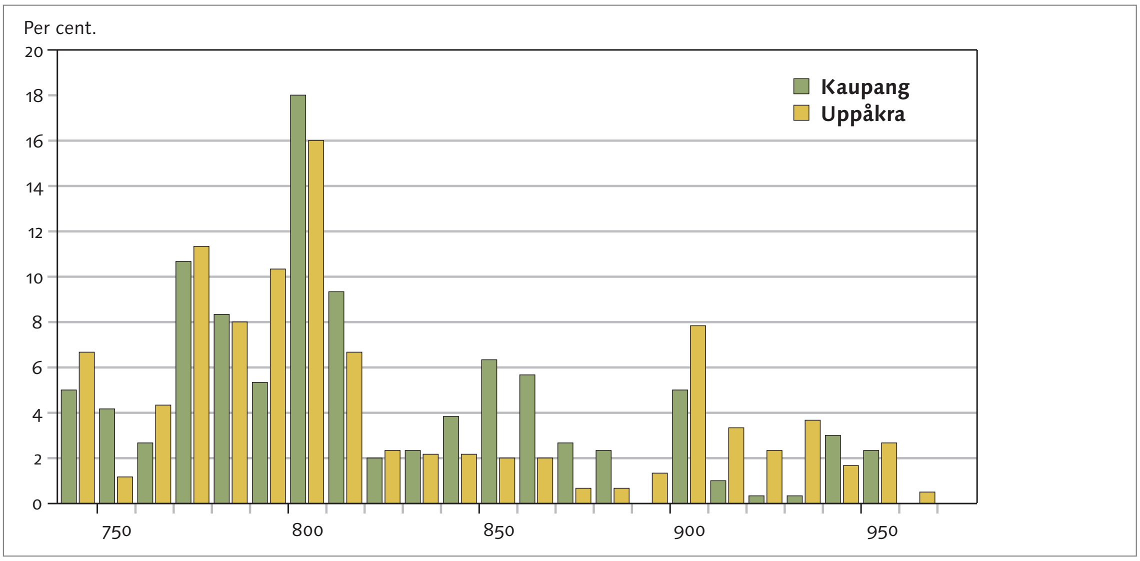
The three Birka sites have very different distributions between them, the Harbour and Town Ramparts finds having an early bias, and the Black Earth finds a much later one. This demonstrates the danger of assuming that the finds from one urban excavation site are representative of the town generally, or of amalgamating the finds in order to analyse them, as Gustin (2004b:108–9) does.

Having compared the broad balance of earlier and later coins, we can now look at the detailed distributions. Histograms of the finds from each of these sites, based on the date of production, are shown in Figure 3.10, from which we can pick out some distinctive characteristics. Compared with the Southern Scandinavian finds, Kaupang (Figs. 3.10.a and 3.11) is clearly very weak in post-890 coins. However, among the small number of 10th-century coins at Kaupang, those of the 940s and 950s are disproportionately over-represented. The four coins of this late period (Nos. 82–5) are exceptional, but while their arrival in Kaupang may have been connected, their loss cannot for they were found spread across all three main areas of the site (Areas 1, 2 and 3). Within its pre-890 element the profile of the 8th- and early 9th-century coins looks fairly typical, but there is a comparatively strong representation of coins from the mid-9th century (c. 840–880).

Uppåkra (Fig. 3.10.b) is also weak in post-890 coins compared with the Southern Scandinavian sample, though not as weak as Kaupang. Its pre-890 element has a fairly typical profile, but the smoothing effect of spreading loosely dated coins over several decades is evident especially in the 9th century. Figure 3.12 presents the data from Kaupang and Uppåkra side by side, from which it appears that Uppåkra has both an earlier and later bias, being somewhat stronger in the 8th century and in the 10th century, while Kaupang has a higher proportion of coins in the 9th century, particularly in the second half. This pattern is perhaps more clearly brought out in the simple percentages shown in Table 3.13.

Paviken (Fig. 3.10.c), as we have already seen, in broad numbers has an even balance between pre- and post-890 coins, but their distribution is not at all similar to that of the Southern Scandinavian sample. The 8th-century coins are more weakly represented, while those of the 9th century are stronger. After 890, rather than the normal peak in the first decade of the 10th century followed by a decline in numbers, Paviken displays a gradual build up to a peak in the 930s, with the decline delayed until the 950s and 960s. From this one might surmise that Paviken particularly flourished during the second half of the 9th century and during the mid-10th century, but one hesitates to press this conclusion in case the differences observed stem more from general changes in the volume of currency on Gotland than from the history of





activity at Paviken. To determine this we really need a control sample based on isolated finds from Gotland alone.

The stratigraphy of the three Birka sites has been considered above. The very different age-structures of their finds is shown graphically in the histograms (Fig. 3.10.d–f). The exceptionally early profile of the finds from Birka Harbour is reflected in none of the other Scandinavian sites shown in Figure 3.10. The finds from the building platform by the Town Ramparts are closer to the Southern Scandinavian sample than other groups, though with a stronger 9th-century element and what appears to be an abrupt ending in the 930s, but since the sample (28 coins) is relatively small this may be misleading and not statistically significant. The Black Earth 1990–1995 excavation site has a predominantly 10th-century distribution, and shows the strongest contrast with Kaupang.

Finally, the distribution of the dirhams from Torksey is included because they had arrived there via Scandinavia and their loss seems to have been restricted to the 870s, and possibly just to the year 872/3. The latest coin is dated 866–868 and it is interersting to compare Torksey's find profile with that of the Loftahammar, Småland hoard (t.p.q. 865) (Fig. 3.13). Torksey appears to have a higher proportion of Early Abbasid (750–800) coins and an anomalously low number from the most prolific decade, 800–810. However, this is probably not a genuine difference, but results from ten of the Torksey fragments being attributed only approximately within the period 750/767–816, and the smoothing effect will have bolstered the later 8th-century columns in the histogram. Taking this into account, the profiles of the Torksey finds and Loftahammar hoard are quite similar, showing that in the 870s, at least, site finds and hoards had a similar composition.

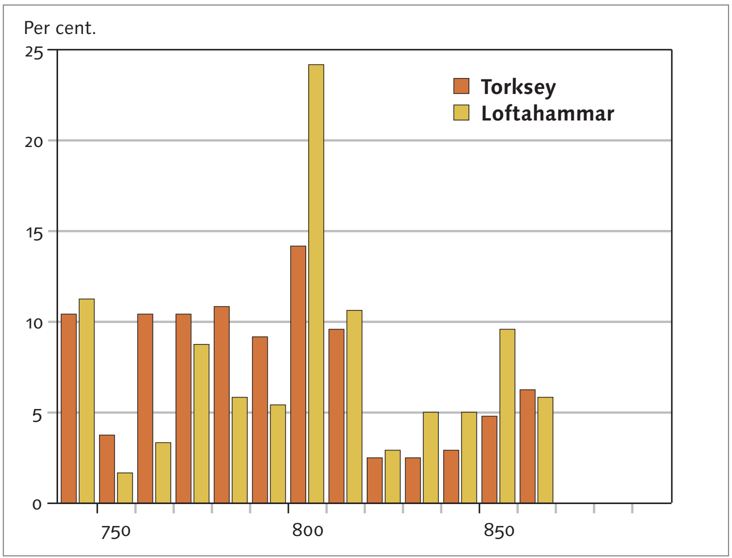


Figure 3.13 *Torksey finds compared with the Loftahammar, Småland hoard (t.p.q. 865) (per cent), by date of production.*

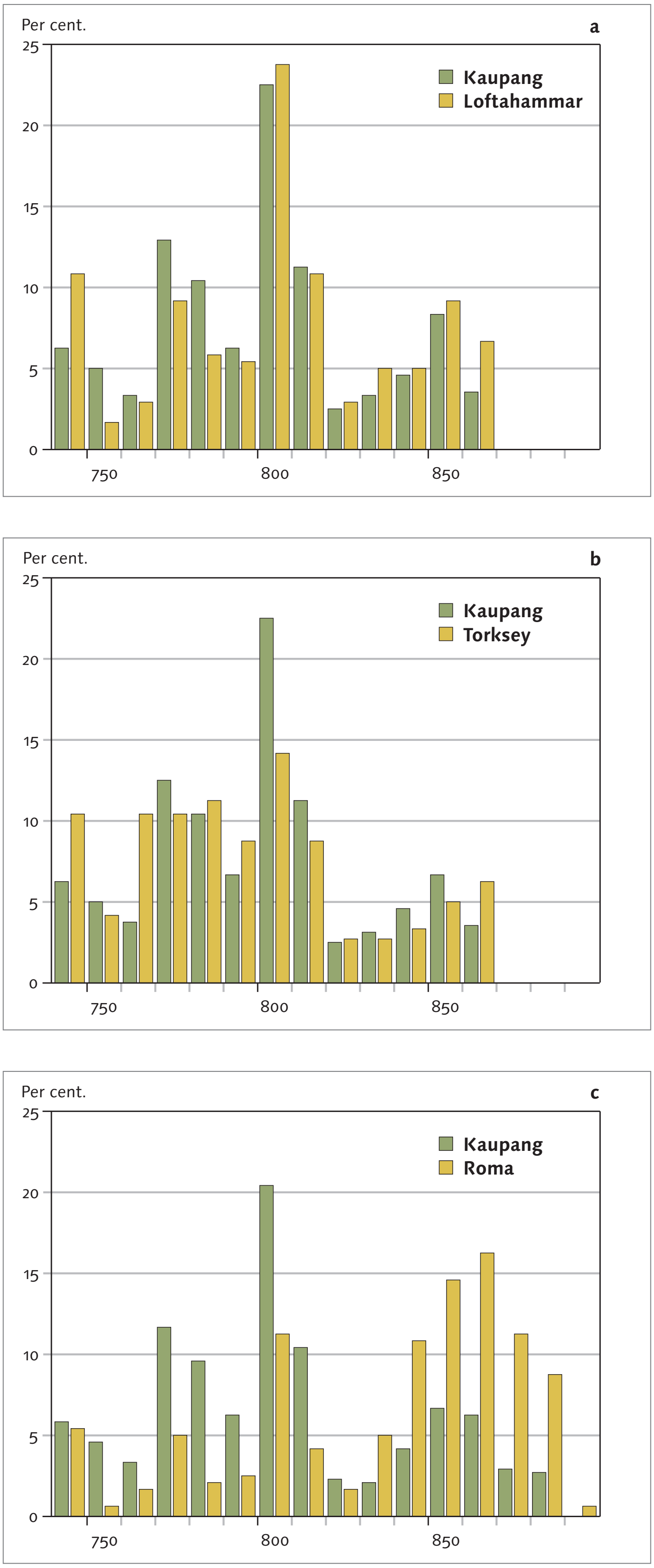
Figure 3.14 *Kaupang finds compared with two 9th-century hoards and single finds from Torksey (per cent):* ***a:*** *pre-865 dirhams from Kaupang compared with those from the Loftahammar, Småland hoard (t.p.q. 865);* ***b:*** *pre-895 dirhams from Kaupang compared with those from Torksey (lost 870s);* ***c:*** *pre-895 dirhams from Kaupang compared with those from the Roma, Gotland hoard (t.p.q. 895), by date of production.*

The dirhams at Kaupang in the 9th century

The earliest hoards show that Islamic coins had reached Eastern Scandinavia by the beginning of the 9th century, albeit in small numbers (Jonsson 1994: 456–8). This evidence is supported by the presence of a dirham in the 1990–1995 excavations in Birka's Black Earth in a stratified level dated c. 780–810/20 (see above, Tab. 3.11). The simultaneous penetration of dirhams to parts of South-Western Scandinavia is shown by the presence of a small hoard of imitations of Umayyad dirhams at Ribe's Posthus excavation, found in a stratified layer dated c. 780–790 (Feveile and Jensen 2000:13, 24 n.10; Feveile 2006c:159). The evidence from Russia, and in particular from Staraja Ladoga, is only marginally earlier, with a hoard of t.p.q. 786 and half-drachms of Tabaristan in a layer dated by dendrochronology to c. 760–770 (Callmer 1990:7; Kirpičnikov 1989).

Dendrochronological dates from Kaupang suggest that the settlement there was first established c. 800, which broadly coincides with the earliest arrival of dirhams in Scandinavia. Whether they immediately penetrated as far as Kaupang is clearly an important question. Although there are many 8th- and early 9th-century coins among the finds, these could well have arrived somewhat later. The site finds, of course, represent an accumulation of individual losses spread over a period, so we cannot expect to match their age profile to that of a hoard. However, hoards are useful for showing what composition the currency that was imported at a particular time into the region might have had. From this, one can build up a possible model of importation and loss for the Kaupang dirhams. We have already seen that coins of the mid-9th century are more strongly represented at Kaupang than in the sample of finds from Southern Scandinavia or those from Uppåkra (Figs. 3.11 and 3.12). If one compares the pre-865 dirhams with those from hoards of around the mid-9th century, such as that from Loftahammar, Småland (t.p.q. 865; Hovén 1982:no. 1), their age-structures are quite similar (Fig. 3.14.a), suggesting that the earlier dirhams need not have been imported until the middle or third quarter of the 9th century. The composition is also similar to that of the Torksey finds deposited in the 870s (Fig. 3.14.b), and the degree of testing with "nicks" is also comparable among these two groups (below sect. 3.5). On the other hand it is clear that the main phase of importation could not have been much later than this, because a comparison of the Roma, Gotland hoard (t.p.q. 895; Hoven 1982:no. 6) and the pre-895 coins at Kaupang (Fig. 3.14.c) shows a poor match, with a much stronger bias in the hoard for coins of the later 9th century. It can be argued, then, that while there is no evidence for an early use of dirhams at Kaupang, the third quarter of the 9th century appears to have been a significant time for their importation at the site, and this may have continued strongly into the fourth quarter and the early 10th century.

The proposition that dirhams arrived in Kaupang in quantity after the mid-9th century gains some support from the stratigraphic evidence. Unlike Birka, at Kaupang there are no stratified finds of Islamic coins, but their very absence from the considerable excavations of intact levels in the Skre campaigns is in itself significant negative evidence. In these two areas the later Viking-period levels had been completely destroyed by medieval and modern ploughing, leaving only the early Viking-period levels available for excavation in their original contexts. The latest intact layers on the sites date from 840/850, but in some parts of the site these and earlier layers had also been ploughed out (Pilø 2007b:149; Pedersen and Pilø 2007:186). Significantly, whereas all of the 92 dirhams from the site come from unstratified layers representing the later medieval or modern ploughsoil, three of the six Western coins were from early strati-



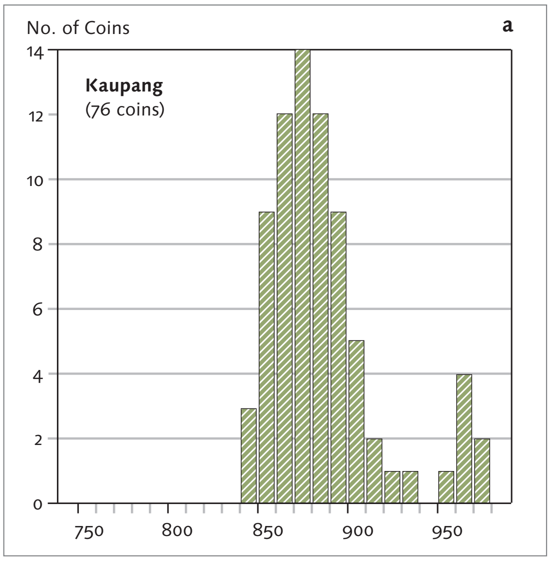
fied contexts (Nos. 7–8 and 10). These coins, it will be argued below, would have been imported to Scandinavia before 840. This is admittedly a small sample, and we cannot rule out the possibility that there were some dirhams in Kaupang during the earlier 9th century, especially due to the fact that silver is poorly preserved. But it seems reasonable to suppose that before the mid-9th century such coinage as was present in Kaupang consisted mainly (perhaps entirely) of Carolingian, Anglo-Saxon or Scandinavian pennies, and that by the third quarter of the 9th century these had been succeeded by a wave of imported Islamic dirhams.

The 10th-century decline in monetary activity at Kaupang

Turning to the end of the period, it is through the dirhams that we may chart the decline in monetary activity on the site. The latest coins are four Samanid dirhams (Nos. 82–5) dating from c. H 334–343 (AD 945–955), the last with a t.p.q. of AD 952. Three earlier Samanid coins (Nos. 79–81) and one Volga Bulgar imitation (No. 86) are dated H 290–301 (AD 902–914), but surprisingly there are none from the intervening three decades. One other imitation (No. 87) is probably from the first half of the 10th century, and so may bridge the gap.

These eight or nine post-890 dirhams represent 11% or 12% of the 76 identified dirhams from the site. This, as we have seen, is the lowest proportion found in any of the Scandinavian samples considered (Tab. 3.12) and shows that there was a significant fall-off in monetary activity compared with the other sites and with the control sample of Southern Scandinavian isolated finds. Yet some of the Umayyad and Abbasid coins could well have remained in circulation after 900 and a few may have arrived in company with coins of the 10th century. Can we determine when this decline occurred and how serious it was?

Figure 3.15 *(a–c) Three alternative models for the rate of loss of dirhams at Kaupang (76 coins).*



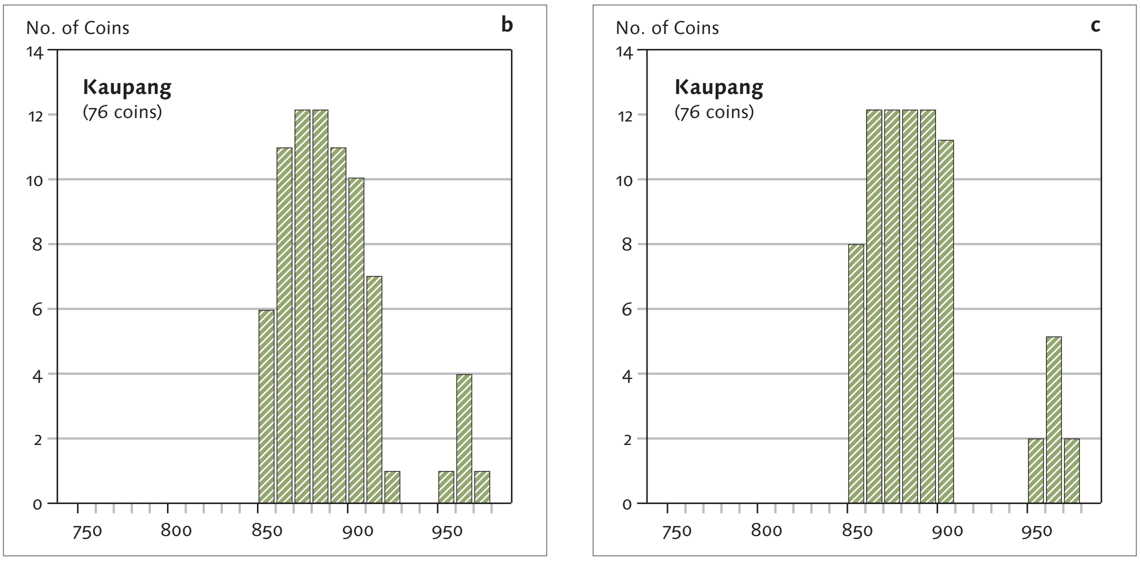
We have seen that Kaupang's find distribution is comparatively strong in the third quarter of the 9th century (above, p. 52). Coins of the 860s, 870s and 880s are well represented compared with most other Scandinavian sites surveyed (Figs. 3.10–3.12), but there are none of the 890s and very few from 900–910 compared with number one would have expected had levels of monetary activity followed the norm. This suggests that the decline in activity had already begun before these early Samanid coins would otherwise have arrived on the site and made an impression on the find record. The very earliest that the first Samanid issues could have reached Kaupang would be c. 900, but it is not really until c. 920 that their numbers would have risen sufficiently and they would have been in circulation long enough for them to have contributed significantly to the finds; see the next section for justification of this date. Had the decline occurred after c. 920 we would have expected to see more early Samanid coins in the finds, but it could have begun earlier, since based solely on the evidence of the coin-finds, the decline cannot be dated more closely within the period c. 890–c. 920.

The cluster of four late Samanid coins struck during 945–955 is quite exceptional, for normally coins of the 940s and 950s are scarcer that those of the preceding decades. They cannot be from a scattered hoard since they have come from all three of the metal-detector survey areas (1–3), and one must assume that they were individual losses representative of a larger number that had been exchanged on the site, so that they would seem to reflect a short period of resumed activity c. 960. However, even this is not a sufficient explanation, since coins of the mid-10th century would not normally occur on their own – in typical Scandinavian and Russian hoards they would be accompanied by earlier Samanid coins and imitations. One might argue that they are the survivors of a very exceptional single consignment of newly minted coinage that had travelled to Kaupang more or less intact from the Caliphate, but against this, the coins show signs of circulation, being fragmented and one bearing a quite elaborate graffito (No. 85). The alternative, and more probable explanation is that the coins arrived in the 950s and 960s in typical mixed groups or individually by way of local transactions, accompanied by earlier coins. If so, some or all of the other five 10th-century coins found at Kaupang may have arrived there and been lost in this late period. This is significant, for it reduces the number of 10th-century coins that might have been lost earlier in the century, emphasising the depth of the decline in monetary activity in the first half of the 10th century.

Lastly, we should consider how long the final phase of circulation might have lasted, and what significance is to be placed on the absence of coins later than 955. From the end of the phase of dirham importation coins of the 950s and 960s are very scarce and by 970 they had virtually ceased to arrive. The Western pennies – German and Anglo-Saxon – which were to replace them in the Scandinavian currency remained scarce until the 980s. This means unfortunately that the final decline of activity at Kaupang falls in a period, c. 960–980, when the importation of new coinage was so low that with the small number of finds from Kaupang one cannot pinpoint the end of the site more closely. Yet the absence of German or Anglo-Saxon coins of the later 10th century does suggest that commercial activity had ceased at Kaupang by c. 980 if not earlier.

Estimating dirham losses per decade

Drawing on the foregoing arguments about the representativeness of the coin hoards, and observations about the introduction of dirhams at Kaupang, the age-structure of the site finds and the decline in coin use there, we can try to build a model reflecting the number of coins lost per decade on the site. Although



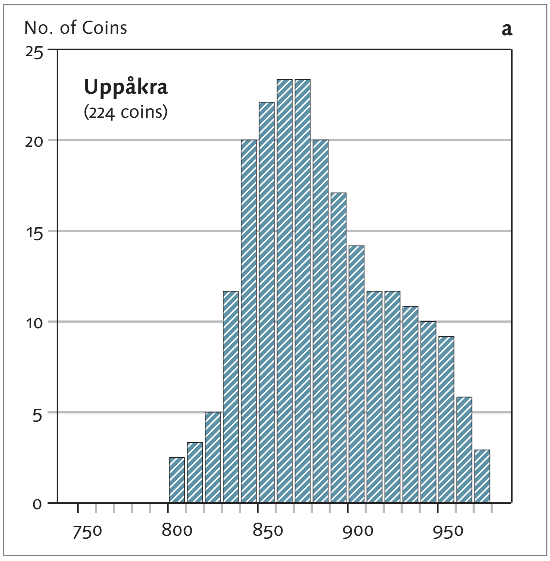
this can only be approximate, it should provide some idea of the relative scale of monetary activity from period to period. The model is constructed in the same way as that for Southern Scandinavian finds (sect. 3.2.5, Fig. 3.8.b), i.e. starting with the 10th-century and distributing the coins by decade, and carrying some over from before 890 where appropriate to replicate the composition indicated by Table 3.7. As we have seen, the four latest Samanid coins (Nos. 82–5) could not have arrived in Scandinavia before the 950s, and they probably represent losses of the late 950s and 960s, perhaps continuing down to the 980s. Some of the other four or five 10th-century dirhams are likely to have been lost with them in that late period, which leaves only two or three 10th-century coins, together with some pre-890 dirhams, to represent losses from c. 900–950.

I have argued that the slump in activity could have occurred at any time in between c. 890 and c. 920, and Figure 3.15 presents three alternative models showing the variations that can be achieved from the same numismatic data. The first (Fig. 3.15.a) assumes the decline in activity began early but progressed smoothly maintaining some continuity through the second quarter of the 10th century. This model involves carrying over seven pre-890 dirhams to be lost after 900. The second (Fig. 3.15.b) leaves the decline in activity on the site as late as possible, maintaining a high level until 920, but the consequence is that the decline is much sharper, leaving no visible activity during the period 920–950. This model involves carrying over 14 pre-890 dirhams to be lost after 900. The third (Fig. 3.15.c) shows how the date of the decline has to be brought earlier if one assumes that all nine 10th-century coins were lost in the period after 950. Further adjustments could be made to the profile of the 9th-century losses, giving a more gradual introduction or changing the position and shape of the peak.

Any of these three models are plausible based simply on the coin-finds, but they may accord to different degrees with other aspects of the archaeological evidence. The first avoids dramatic changes in activity, and could be seen as better reflecting the dating of items of ornamental metalwork found on the site, which are predominantly 9th-century. The second, on the other hand, extends full-scale activity on the site into the first two decades of the 10th-century, which gains some support from the reassessment of the graves in nearby cemeteries. These are much more numerous in the first half of the 10th century than in the 9th, and there is a definite continuity in the burial customs, which would indicate the presence of a substantial population in the locality well into the 10th century (Stylegar 2007:78–82). However, all of the models show that the bulk of the coin-losses fell during the second half of the 9th century, with few if any in the second quarter of the 10th century. It is important that each category of evidence should be assessed on its own merits.

Applying similar considerations to the finds from Uppåkra, Paviken and Birka, their likely distributions of dirham loss can be reconstructed (Figs. 3.16.a–c). From the excavations in Birka's Black Earth 1990–1995 (Fig. 3.16.c) there is stratigraphic evidence for coin-loss as early as the late 8th or early 9th century, but it remained at a low level until the end of the 9th century. For Uppåkra and Paviken there is no stratigraphic evidence, but, as we have seen (above, 3.3.1), a comparison of the age-structures of their 8th- and 9th-century coins suggests that the period of intensive coin use and loss fell somewhat earlier at Uppåkra than at either Paviken or Kaupang. Accordingly, Figure 3.15.a places greater emphasis on coin-loss in the middle decades of the 9th century. Although for Paviken the pre-890 dirhams have a rather later profile, it is not clear whether coin use there may have started in the early 9th century and

Figure 3.16 *Models for the estimated rate of loss of dirhams at other Scandinavian sites:* ***a:*** *Uppåkra;* ***b:*** *Paviken; and* ***c:*** *Birka 'Black Earth' 1990–1995.*



remained at a low level, as at the Birka Black Earth site, or whether it only began towards the end of the century. In this respect the histogram in Figure 3.16.b is arbitrary.

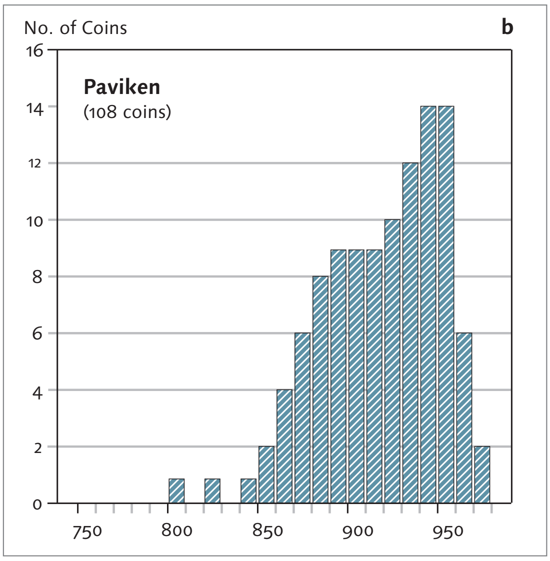
As with the Kaupang distribution models, one could adjust the shape and position of the 9th-century peaks to some extent, but the profiles of the 10th-century losses are more firmly established, being dictated partly by the coins' dates of production; they could only have been lost after they were struck and allowing time for them to travel to Scandinavia. Whereas the 10th-century coins found at Uppåkra peak in their production date during the first decade, then fall off sharply, those from the Paviken and Birka 1990–1995 excavations build up progressively, peaking in the second quarter of the century (Fig. 3.10). At all three sites there is uncertainty about how late and how intensively the circulation of dirhams continued, since the importation of newly minted dirhams had declined and virtually ceased by 970. We cannot judge whether the use of dirhams on these sites also declined slowly or came to a more abrupt end.

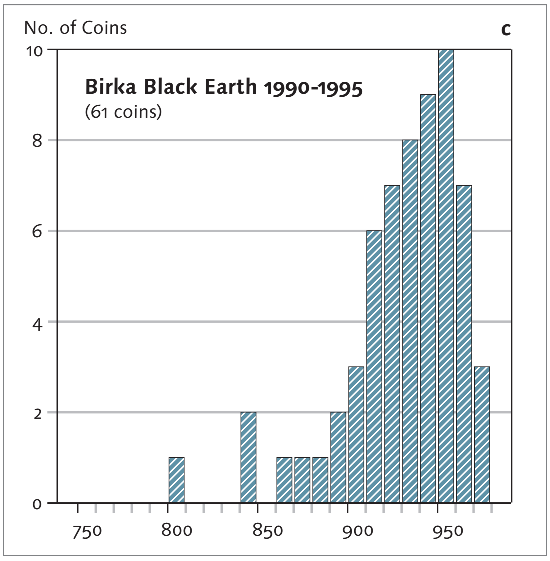
The histograms in Figures 3.14 and 3.15 illustrate fundamental differences in the pattern of coin-loss on these four sites. Differences between Kaupang and the Birka Black Earth site are particularly marked. The model for Birka supports the archaeologists' observation that the majority of the finds at this site came from the ploughsoil, which represents losses from the last decades of Birka's activity, c. 930–c. 970. By this period Kaupang's heyday was well and truly past.

3.3.2 The 9th-century Western coins

The two Anglo-Saxon coins, both found in the Blindheim excavations, were East Anglian issues of Coenwulf of Mercia (796–821) (Nos. 9–10; Fig. 3.17.a). They cannot have been lost or deposited together since one was in an original context sealed by Blindheim's House 1, while the other was in the ploughsoil. The London (Middle Temple) hoard implies that by c. 840 coins of Coenwulf made up only 10% of the currency, and it is likely that these two coins had left England before then. Indeed, looking at the pattern of Anglo-Saxon coins found in Norway it would seem that the first quarter of the 9th century was a period when links between England and Norway were particularly strong, for there are two coins from c. 775–800, eight from 800–825, but then none for a further century (Blackburn and Jonsson 1981:149–50; Skaare 1960a; Screen, in press). English coins of the early 9th century do not occur elsewhere in Scandinavia, so it is most likely that these coins came direct to Norway before c. 825, and at least by c. 840. The likelihood is that they were lost during the first half of the 9th century.

The three Carolingian coins – two from Blindheim's excavations (Nos. 6 and 8) and one from Skre's excavations (No. 7) – are all of the same *Christiana Religio* type of Louis the Pious, struck 822/3–840 (Fig. 3.17.b). This issue remained in circulation in Francia until 864. However, Metcalf (1996: 423–5) has shown that there is a wider pattern of Carolingian finds in Scandinavia in which this issue of Louis the Pious dominates, but the successive types of Lothar (840–855) and Charles the Bald (840–879) are virtually absent. They appear, then, to represent a wave of coinage exports from France or the Low Countries before 840. Moesgaard (2004) has argued that they may have been brought to Scandinavia through the missions of Bishop Ansgar in the 820s and 830s, although trade and other contacts seem an equally likely means. Their arrival and use in Kaupang may well have been broadly contemporary with that of the two Anglo-Saxon coins. Indeed, one of the coins (No. 8) was found stratified in close proximity to an Anglo-Saxon coin (No. 10), while another was the





only stratified coin from the Skre excavations, confirming that they were relatively early losses on the site.

The only Scandinavian coin (No. 11; Fig. 3.17.c) belongs to the same period. It is one of the early Nordic issues of Malmer's class KG5, which she dated to c. 825 or a little later and attributed to Hedeby (Malmer 1966:195–6, 210–19, 340–1; Malmer 2002b). The designs copy the so-called "Wodan/Monster" sceattas that have now been identified as an 8th-century coinage of Ribe, and Metcalf (1996:416–19) has suggested that Malmer KG5 was also struck there. The attribution is based not just on continuity of design, but on the nine finds of 9th-century Scandinavian coins from Ribe itself, which are all certainly or probably of this type (Feveile 2006c:157–8). It is appropriate that this rare type should have found its way from Ribe to Kaupang, the neighbouring North Sea emporium up the coast to the North.

Why so few West European coins?

Despite Kaupang's very westerly location, with obvious routes across the North Sea to England and south to Denmark, Frisia and Francia, it is notable that there should be only six West European silver coins among the 101 finds. It is also notable that five of the six came from Blindheim's excavations, representing 19% of her finds, while only one was present among the 16 recent excavation finds from the MRE (6%). This difference may in part be due to the use of sieving and metal detectors in the recent excavations, which will have been far more successful in finding small fragments of dirhams than Blindheim's excavation techniques would have been. Nonetheless, this cannot be the only factor. It is unlikely that Blindheim's five coins were from a dispersed hoard, since they were discovered during four separate seasons of excavation between 1959 and 1965. However, two of them, found in close proximity under the inner stone line of House 1 (Nos. 8 and 10), may have been associated losses. Many of the finds from the MRE came from the modern ploughsoil, but Blindheim did not investigate this, for she had it removed by machine. Her finds may therefore represent to a greater degree the earlier cultural layers on her site than the finds from the MRE. Still more surprising is the fact that there were no Western coins at all among the 56 coins found in the metal-detector surveys, even though in many parts of the site the oldest cultural layers had been disturbed by ploughing (Pilø 2007b:149), Blindheim's finds of five Western coins may, then, reflect a genuine difference in the function of her site in the first half of the 9th century.

We have seen that six Western coins are all likely to have been brought to Scandinavia before 840, and it has also been argued that dirhams need not have arrived at Kaupang until after the mid-9th century. Significantly, whereas all of the 92 dirhams from the site (including the fused group) come from unstratified layers representing the medieval or modern ploughsoil, three of the six Western coins were from early stratified contexts (second quarter of the 9th century) in the Blindheim or Skre excavations. We have already seen that only the earlier contexts at Kaupang survive intact, as the later Viking-period layers were disturbed by ploughing. If there are more Western coins on other parts of the site, they may still be sealed beneath the ploughsoil. It would seem then that during the earliest phases the coinage used at Kaupang consisted mainly (perhaps entirely) of Carolingian, Anglo-Saxon and Scandinavian pennies, but these were subsequently swamped by a wave of dirhams and removed from circulation by natural wastage. Thereafter during the second half of the 9th century Western coins seem not to have been imported in significant numbers, and perhaps, as Coupland (1991, 2007) has argued, they were less acceptable than dirhams in transactions, with the

Figure 3.17 *Western silver coins:* ***a:*** *Anglo-Saxon, Coenwulf of Mercia (No. 10);* ***b:*** *Carolingian, Louis the Pious (No. 6); and* ***c:*** *Scandinavian, KG5 (No. 11). Photo, Lill-Ann Chepstow-Lusty, KHM.*

result that they were not attracted to Scandinavia or were preferentially melted down when forming ingots and jewellery.

In contrast to the dirhams, which are highly fragmented, three of the Western coins appear to have been whole when lost (Nos. 6, 7 and 10), while two others (Nos. 8–9), although only pieces now, may have been whole but broken naturally in the ground owing to their fragility. Only the Scandinavian coin (No. 11) shows signs of having been mounted as an ornament, and Skaare thought this had later been cut up as bullion, in view of its appearance when newly excavated; subsequent chipping of the edges has obscured this however. There are no signs of the five Anglo-Saxon and Carolingian coins having been pierced or mounted for use as ornaments, which might suggest they fulfilled a different role than the small dirham-fragments. However, a piece of hacksilver and a broken silver fragment were found in the same layer as the Carolingian denier (No. 7) on plot 4A of the main research excavation, and in stratified deposits of similar date (Site Period II) from other plots there were a further four pieces of hacksilver, two silver fragments and six lead weights (Pedersen, this vol. Ch. 6:162). These finds suggest that an economy based on weighed silver was already emerging in the second quarter of the 9th century before the widespread use of fragmented dirhams, and that the Western coins may have contributed to this.

The site finds from Uppåkra provide an interesting parallel. As we have seen, the Viking-period finds have a slightly longer span than at Kaupang, with a stronger representation of pre-800 issues, suggesting that the use of dirhams may have begun earlier there, and a higher proportion of 10th-century Samanid dirhams and even a few finds of Anglo-Saxon, German and Scandinavian pennies of the later 10th and 11th centuries. Yet Viking-period Uppåkra is still predominantly a 9th-century site. What is interesting, however, is that the proportion of Western pennies of the 9th-century (seven Carolingian and three Scandinavian) is also small (4%) and they too all appear to date from before 840. At Birka, where Carolingian coins are also rare, they have mainly been found in graves and looped as ornaments, in which form they survived into the 10th century (Ambrosiani 2006); and the same is true of the more plentiful 9th-century Scandinavian coins from Birka (Gustin 2004a:14).

3.3.3 The Roman, Merovingian and Byzantine coins

Two earlier elements – Roman and Merovingian – within the coin-finds pose tricky questions of chronology. One bronze coin of Valentinian I (364–375) (No. 2) found by Blindheim's team was regarded by Skaare as likely to be a modern loss (Skaare 1976:33). He knew of only four other Roman bronze coins from Norway, which he interpreted in the same way.

The discovery of a second piece – a bronze coin of Constantine I (307–337) (No. 1; Fig. 3.18.a) – in the MRE casts fresh light on these finds, and makes it very probable that the Kaupang coins were old losses. They are most unlikely to be associated deposits since they were found 250 metres apart on different sides of the site's highest point. Recent unpublished research by Håkon Ingvaldsen has increased substantially the number of Roman bronze finds from Norway, and he too believes that a proportion of them are old losses. But when were the Kaupang coins lost? There is no archaeological evidence for human activity at the site before the late Merovingian period or early Viking Period (Pilø 2007c:174–5), and while the beach could have been used as a landing point at any time, it would be an improbable coincidence if in the Iron Age two Roman bronze coins had been dropped in different parts of the site later to become the principal emporium in 9th-century Norway. It is much more likely that they were lost during that phase of settlement and commercial exploitation.

A Roman bronze coin of Constantius II (337–361) found in the ploughsoil at Birka (Rispling 2004a:no. 30; Nilsson 1995) has been interpreted as a Viking-period loss. At Ribe, three Roman bronze coins of the 2nd–4th centuries were found in 8th-century layers at the Market Place (Bendixen 1981:97, no. 33; Feveile 2006c:158). From Iceland, there are six Roman bronze coins preserved in the National Museum found in five locations between 1904 and 1993 (Anton Holt pers. comm.). All are bronzes of the 3rd century, and they form a plausible group, even if only one of them was found archaeologically, during the excavation of a Viking-period farm at Hvítáholt. Holt is inclined to see most if not all of these finds as losses by early settlers, in which case they can only have been brought to Iceland after its colonisation in the later 9th century.

The most glamorous coin-find from Kaupang must be the Merovingian gold "Dorestad" tremissis found in 2001 (No. 5; Fig. 3.18.b). The piece, which dates from the mid-7th century, has the name of Dorestad and the moneyer Madelinus, but it belongs to a large group of coins in a somewhat devolved style, which Pol (1990) thinks may have been produced elsewhere in Frisia imitating the original Dorestad coins of more refined style. The coin shows no signs of wear or having been mounted as jewellery.

This is the first Merovingian gold tremissis of the 7th century to have been found in Norway, and indeed the most northerly find in Europe. Seven other tremisses of this period have been found in Scandinavia (Fig. 3.19), all from what was once Denmark (Metcalf 1996:400–1, discussing the first five finds). Two are from the island of Sylt (Dronrijp type from an uncertain mint in the Netherlands; and Périgueux, Dordogne, France) and one from nearby Föhr (Maastricht, Ansoaldus). To the north from Dan-

a

b

Figure 3.18 *Roman and Merovingian coins:* ***a:*** *Constantine I (No. 1); and* ***b:*** *Dorestad gold tremissis (No. 5). Photo, Lill-Ann Chepstow-Lusty, KHM.*

Figure 3.19 *Distribution of 7th-century Merovingian gold tremisses found in Scandinavia. Map, Elise Naumann.*

Figure 3.20 *Plan of the Kaupang site showing the locations of the coin-finds. Map, Elise Naumann.*

kirke, near Ribe, there is another Dorestad tremissis, as well as two silver deniers of the later 7th century of the same Dorestad/Madelinus type, and north again from Gadegård there is yet another Dorestad tremissis of this type. The sixth is a recent find from Jelling, in Eastern Jutland, again of the Dorestad type (Moesgaard and Pol 2003), while the seventh is from an archaeological survey in 2005 of a high-status site at Füsing, 5km north-east of Hedeby, the coin being a mid-7th-century derivative of a Mainz issue but struck at some uncertain mint in the Lower Rhineland or Low Countries (Dobat 2005). The Kaupang find therefore fits neatly into a pattern of a coastal distribution up the North Sea littoral, dominated by issues from the Netherlands.

The Danish finds are thought to be contemporary or near contemporary deposits of the 7th- or early 8th-century, but what about the Kaupang find? Should it, by analogy with the two Roman finds, be attributed to the 9th century? Gold was exceptionally rare in the Viking Period, and then the coins most likely to have been available are either Carolingian solidi of Louis the Pious and their Frisian imitations, or Islamic gold dinars, both of which were present in the fabulous gold hoard from Hoen, Norway (Skaare 1976:134, no. 33; Skaare 2006; Blackburn 2006). Hoen also included two much older coins, a 4th-century Roman solidus and a late 6th-century Merovingian solidus, but both were very heavily worn and had been used as jewellery for several centuries. Since the Kaupang tremissis shows no sign of wear or having been mounted, and fits so well the pattern of 7th/-early 8th-century losses, I believe that this too is most likely to have been lost during that period. If so, it would pre-date the earliest seasonal settlement at Kaupang (c. 800), and even the establishment of the hall at Huseby in the mid-8th century. Evidence for use of the harbour and beach for occasional activities in the century prior to the settlement is slight, but cannot be ruled out (Pilø 2007c:172–5).

The third exotic element of the finds is Byzantine copper coins. One coin can be recognised with some confidence as a Byzantine follis of the 8th or 9th century (No. 3), although it has not been possible to identify the emperor or mint because corrosion of the surface has left only the vague image of a facing bust with hatched tunic and a crown with pendelia, contained within a circular but illegible legend. A second piece (No. 4), in an even worse state, is with less certainty a Byzantine coin but, if it is, it would have been a slightly later follis from the 9th or 10th century, judging from its larger flan size. Both were found in the modern ploughsoil over the main excavation site. Byzantine silver miliaresia, particularly ones struck after 945, have long been recognised as a small but significant element of the Scandinavian finds. Copper coins are much rarer as finds, and, as with Roman copper, there has often been some uncertainty whether they are old or modern losses. In Sweden, a survey of 23 recorded finds, three of which were from graves, revealed a distinctive pattern with the earlier coins (6th–9th centuries) coming from Northern Sweden and Birka and the 10th- and 11th-century coins from elsewhere in the Mälar region, Southern Sweden and Öland (Hammarberg et al. 1989:14). The Birka Black Earth 1990–1995 excavations yielded one follis of Basil I (867–886), struck at Constantinople in 868–870, stratified in Phase 8 (c. 940–950/60), while four other corroded copper disks may possibly be other Byzantine coins (Rispling 2004a:no. 57 [Basil I] and nos. 33, 39, 56 and 96).

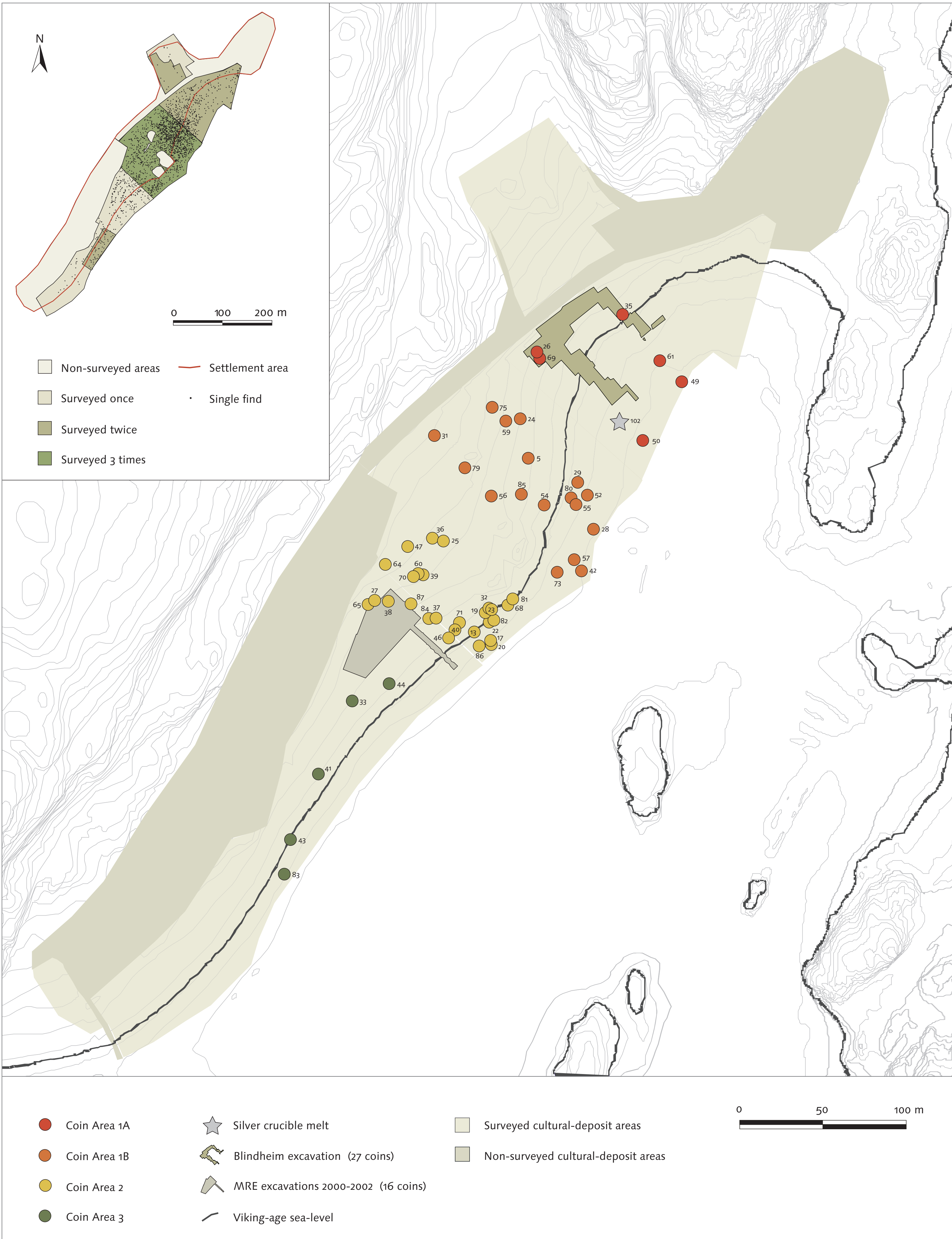
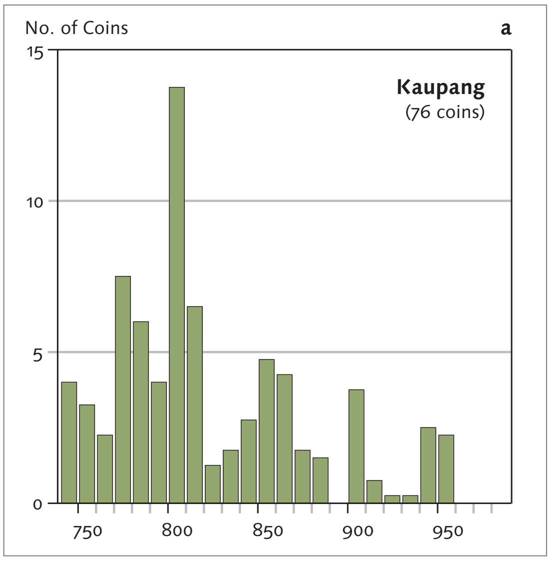

N
0 100 200 m
Non-surveyed areas
Settlement area
Surveyed once
Single find
Surveyed twice
Surveyed 3 times
Coin Area 1A
Silver crucible melt
Surveyed cultural-deposit areas
Coin Area 1B
Blindheim excavation (27 coins)
Non-surveyed cultural-deposit areas
Coin Area 2
MRE excavations 2000-2002 (16 coins)
Coin Area 3
Viking-age sea-level
0 50 100 m

Figure 3.21 *Dirham finds from Kaupang excavations compared with all finds from the site, by date of production:* ***a:*** *All dirham finds;* ***b:*** *MRE;* ***c:*** *Blindheim's excavation.*



That these Roman and Byzantine bronze coins may well be 9th- or 10th-century losses begs the question of what function they served at Kaupang. It unlikely that they had any monetary function. One possibility is that they served as raw material for working in copper alloy, as suggested for the Ribe finds (Feveile 2006c:158), but their inclusion in some Swedish graves suggests that they could have had a specific function. Nilsson (1995) has suggested that the Roman coin at Birka may have been used as a weight, for which there are good Anglo-Saxon parallels (Scull 1986).

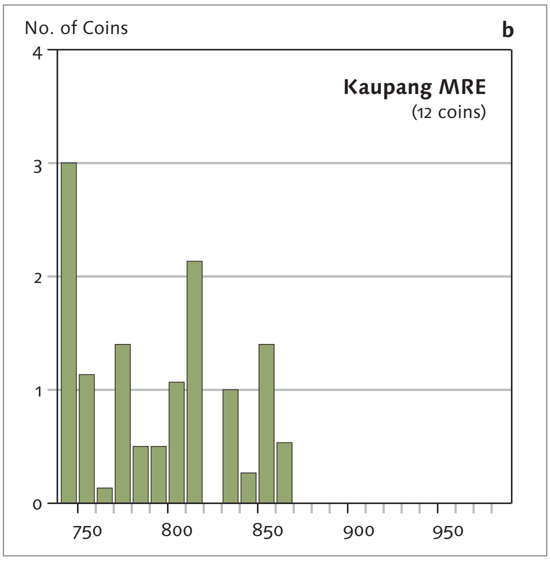
3.4 The spatial distribution within the site

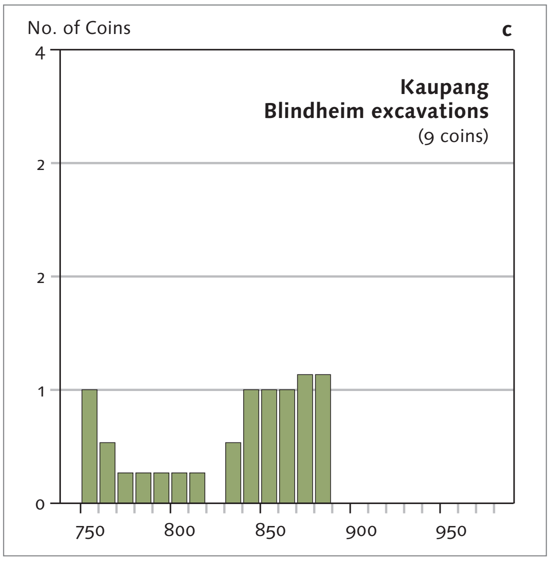
The location of each coin and artefact recovered in the 1998–2003 investigations was recorded and plotted using GIS. However, since the coins were almost all found in the disturbed context of the medieval or modern ploughsoil care must be taken in interpreting their spatial distribution on the site. The site slopes gently down towards the waterfront to the south-east, and away from a central rocky plateau that would have divided the settlement, just to the north of the MRE. That there has been considerable movement of topsoil and of artefacts in it is demonstrated by the number of coins found beyond the Viking-period shore line, i.e. in an area which was then under water (Fig. 3.20). One cannot, therefore, expect a close relationship between the artefacts found in the modern ploughsoil and the original features lying immediately beneath them. Those artefacts recovered from excavation of the late medieval plough-layer seem to have suffered rather less displacement, as the correlation with stratified features and finds is closer (Pedersen, this vol. Ch. 6:158,164).

From the MRE area, six dirham-fragments (Nos. 12, 14, 15, 53, 63 and 98) were found in the later medieval plough-layer, one over plot 4B, where the stratified Carolingian coin (No. 7) was also discovered, and four north-east of plot 4B and one above the adjoining plot 3B (Pedersen, this vol. Ch. 6:162–4, Fig. 6.29). They were accompanied by a concentration of hacksilver and other fragmentary silver pieces, together with a few weights. One of the Roman copper-alloy coins (No. 1) came from the later medieval plough-layer above plot 2A. The six dirhams from the modern ploughsoil over the excavation site (Nos. 16, 21, 30, 45, 58 and 62) and two possible Byzantine bronze coins (Nos. 3–4) were more widely dispersed, as were the hacksilver pieces and many weights from the modern ploughsoil. These twelve dirhams all date from before 870 (Fig. 3.21.b), and so too do three coins from the metal-detector survey that were picked up there prior to the excavations (Nos. 27, 38 and 65). However, the sample is small and the absence of later issues may not be significant since, nearby the metal-detector survey in Area 2 turned up several 10th-century coins.

In the Blindheim excavations most of the 24 unstratified coins were dispersed in the ploughsoil over or immediately in front of the plots by the waterfront, and were found in company with hacksilver and weights, but a further group of coins and silver pieces was recovered from what would have been part of the harbour area (Pedersen, this vol. Ch. 6: Fig. 6.30). Only nine of the dirhams can be identified, and most of those are dated within quite broad ranges which all fall before 892 (Fig. 3.21.c). As with the finds from the main research excavation, the sample is too small for the absence of later coins to be of significance.

The finds from the general metal-detector survey of the settlement site, all coming from the modern ploughsoil, cannot be closely analysed because of the considerable displacement many will have suffered. The greatest density of coin-finds comes from the central section of the site, either side of the rocky plateau, which itself is almost devoid of finds. The





higher density appears to be a genuine pattern, although it will have been exaggerated because the area was surveyed three times by the detector-users, compared with twice on the northern part of the site and only once for most of the south. A map showing the average number of artefacts per survey confirms that there are real concentrations in these areas (Pilø 2007b:148–50, Fig. 7.7). In order to investigate the compositions of finds from different parts of the site, it has been divided into three broad areas: Area 1, that lying to the north of the rocky plateau; Area 2, a central section, between the plateau and the main research excavation of 2001–2002; and Area 3, the southern section. Area 1 is subdivided into 1A, the northern part of the site around the Blindheim excavations, and 1B, the section within 100 m of the central plateau. A plan (Fig. 3.20) shows the extent of the settlement area, marked in red on the inset, and indicates that as many detector finds were recovered from land now covering the Viking-period harbour, as were recovered from the settlement itself, demonstrating the degree of the soil and artefact displacement.

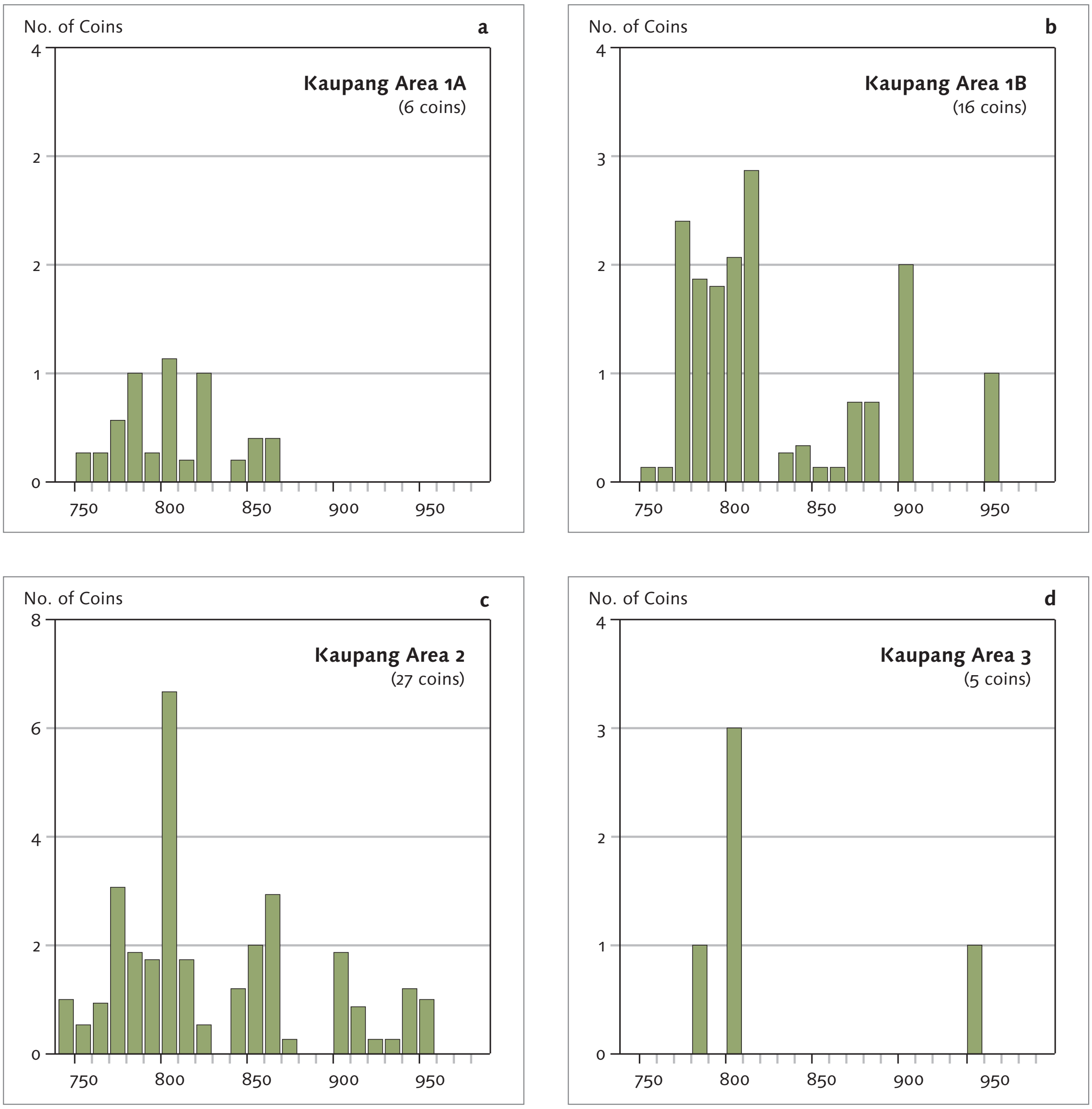
Most of the 10th-century dirhams have been found on or beyond the Viking-period waterfront, and with the exception of one coin from the south of the site, they are all concentrated in a 150-m stretch in the centre of the 700-m waterfront (Areas 1B and 2). The number of 10th-century coin-finds is rather small and they mainly come from the most prolific section of the site, but if their absence from the northern part (Area 1A; Fig. 3.22.a), including the Blindheim excavations, is a genuine feature and not merely a statistical quirk, it could suggest that there had been a physical contraction in the settlement or a change in the distribution of certain activities by the early 10th century. The small number of other 10th-century artefacts tend to show a similar concentration but allows no firm conclusions to be drawn.

The age-structures of the finds from Areas 1B, 2 and 3 are broadly similar (Fig. 3.22.b–d). From each there are both 8th-/9th-century and 10th-century finds. The number of coins from Areas 1A and 3 is too small to justify close analysis, but the samples from Areas 1B and 2 are of comparable size, and the profiles of their histograms are not significantly different from one another or from the overall assemblage of the Kaupang dirhams.

An alternative way of considering the distribution of coin-finds over the site has been considered by Pedersen. She has compared the distributions of weights, coins and silver in the form of hacksilver and other fragments. Her map of the detector finds (Fig. 6.30) shows a broadly similar distribution of all three classes of artefact across the length of the site. Finds are scarce in the northern and southern sections, and the greatest concentration comes from the centre of the settlement – but, as already mentioned, this did receive more attention from the metal-detecting group than any other parts. The section immediately to the north of the plateau (Area 1B) has the greatest concentration of weights and hacksilver, while for coins there were slightly more finds from the section to the south of this (Area 2). All material had suffered a similar dislocation down the slope towards the waterfront.

3.5 Fragmentation, graffiti and other secondary treatment of the coins

In the Catalogue (Rispling et al., this vol. Ch. 4), we have noted the physical properties of the coins: their state of preservation; whether they are whole or fragmentary; if fragments whether their edges appear to have been cut with a sharp chisel or other blade, broken deliberately or damaged through corrosion; and any secondary treatment the coin received in the Viking Period, such as piercing, bending, nicks or graffiti.



3.5.1 Fragmentation

The Islamic coins found at Kaupang range in size from whole coins to the tiniest of fragments, but in general they are quite finely divided. The degree of fragmentation of coins in hoards has been seen as a reflection of the frequency and nature of the transactions in which they have been used and it has been shown to vary both regionally and chronologically (Hårdh 1996:86–9; however, see caveats in Metcalf 1997:392–7). The Islamic finds from Birka, Paviken and Uppåkra are also fragmented to a high degree; among the 81 single finds from the Birka Black Earth 1990–1995 excavations 58 (72%) were only a quarter of a dirham or less (Rispling 2004a:35; Tab. 3.4 adjusted). In a group of 68 well-preserved dirhams recorded from the site at Torksey, Lincolnshire, 88% were smaller than a quarter of a dirham, and they had an average weight of 0.46g (Blackburn 2002; supplemented by Portable Antiquities Database on www.finds.org.uk). The c. 400 dirhams found at Janów Pomorski (Truso) in Poland are also described as small fragments (Bogucki, in press).

It is likely that some of the dirhams were already fragmented when originally imported from the Caliphate, for in Near Eastern hoards after the mid-9th century broken pieces are a common element (Ilisch 1990). However, further fragmentation probably took place as needed for transactions in Eastern Europe and Scandinavia (Malmer 1985:49–51). Coins that have been cut with a chisel, rather than broken by bending, will probably have been divided since leaving the Islamic lands; both methods are common among Scandinavian finds, even on the same fragment. We have already considered whether in hoards older coins tend to be more fragmented than younger ones, and found that in those hoards examined there was not a marked difference (sect. 3.2.6). Local practice would probably have dictated the preferred average size for transactions and less convenient pieces could have been divided if too large or passed out of

Figure 3.22 *Dirham finds from the metal-detector survey, by date of production:*
a: *Area 1A;* ***b:*** *Area 1B;* ***c:*** *Area 2; and* ***d:*** *Area 3.*

the area or melted down as bullion if too small. The average size of fragments in circulation need not have depended on the age-structure of the currency. Hårdh's suggestion, based on an analysis of 10th- and 11th-century hoards, that a finer degree of fragmentation was generally a later phenomenon (Hårdh 1996:86–91), was subject to exceptions as the site finds indicate. The finds, for example, from Truso and Torksey demonstrate that finely fragmented dirhams were being used around the mid-9th century.

It would not be valid to compare the degree of fragmentation of coins from different sites since the size of recorded specimens will be influenced very much by the methods and skill with which they have been recovered from the ground, the nature of the soil influencing the strength of signal given by small silver pieces and the conditions for preservation of metals. Factors such as the extent to which the spoil was sieved and the sensitivity of metal-detectors, which have improved greatly over the last 15 years, are bound to influence the degree to which very small fragments can be found. The results will vary from site to site. Within one site, however, one can compare the degree of fragmentation among coins from different periods, since the survival and recovery rates should have been similar for dirhams of any period, if the same methods of excavation or survey were applied.

Unfortunately, at Kaupang the conditions for the preservation of silver are poor, and many of the coins had been affected by corrosion or, having become brittle, had been chipped or broken in the ground. Of the 90 dirhams that were single finds from the site, 30 (33%) show signs of significant or heavy corrosion, and others have suffered to a lesser degree. Sometimes the struck surface has been lost or occasionally it is encrusted with corrosion products, and it is likely that some coins will have disintegrated totally in the ground. These factors have affected both the size and the weight of surviving specimens; e.g. two of the whole dirhams that should weigh c. 2.97 g have weights reduced by corrosion to only 1.70 g and 2.17 g (Nos. 26 and 37). A higher proportion of coins are heavily corroded among the finds from Blindheim's excavations, hence the average weight of fragments from those is much lower than fragments from the recent excavations and metal-detector surveys. The reason for the difference in preservation is unclear, although comparing photographs of coins published in the early 1960s with recent ones it is clear that they have deteriorated to some extent since being found.

It is, then, with considerable hesitation that the analysis of the average weights of fragments in Table 3.14 is presented. If the very low weights of the Blindheim excavation coins can be attributed to a high degree of corrosion and modern breaking, the slightly lower average weights of fragments from the MRE and CRM excavations could be due to the recovery of smaller pieces by sieving or the added care with which spoil from the excavation was investigated with metal-detectors. The only groups that may stand comparison with each other are the metal-detector surveys, and here there is a notable difference between the weights of the fragments from Areas 1B (0.51 g) and Area 2 (0.85 g), both with reasonably large statistical samples. Area 2 has also produced more whole coins. No appreciable difference in the age-structures of the dirhams from these two areas was detected (sect. 3.4), and so it is possible that there was a different activity taking place on a part of Area 1B that resulted in more fragmented coins being lost.

The comparison of average weights by period may be more valid, since the coins which are all from the ploughsoil should generally have been subjected to corrosion and breaking to a similar degree. The pre-833 coins at 0.63 g are slightly lighter than the later ones (c. 0.75 g), but considering that by the time they were lost at Kaupang many would have been 70–100 years old, if not more, one might have expected them to have become even more fragmented during exchange transactions. However, part of that time will have been spent circulating in the Caliphate, where it seems the practice of dividing coins only began in the mid-9th century when dirhams ceased to be struck to a fixed standard and coins started passing by weight not by tale (i.e. counted out); thereafter fragments were required to make up precise sums of money (Ilisch 1990:122). Hence the pre-833 coins may not have circulated in a fragmented state much longer than those of the two later periods. It is of interest that the average weights of the mid- to late 9th-century coins and the 10th-century coins are virtually the same, although admittedly some of the former may have been lost in the first decades of the 10th century. It indicates that at Kaupang there is no evidence to show that the currency was becoming more finely divided over time,

Find Group	No. of dirhams	No. of whole coins	Average weight of fragments (g)
Blindheim Excavations 1956–1974	21	1	0.38
MRE and CRM Excavations 1998–2003	14	1	0.50
M-d Survey Area 1A	6	1	0.83
M-d Survey Area 1B	16	-	0.51
M-d Survey Area 2	28	5	0.85
M-d Survey Area 3	5	1	0.73
Period	**No. of dirhams**	**No. of whole coins**	**Average weight of fragments (g)**
Pre-833	51	8	0.63
834–890	16	1	0.74
890–960	9	-	0.76
Unidentified	14	-	0.25
All	90	9	0.60

Table 3.14 *Average weights of dirham-fragments and numbers of whole coins at Kaupang, by find-group and by period. (Note: The dirham standard was 2.97 g, but the weights varied from the mid-9th century.)*

which is contrary to the pattern Hårdh has observed in hoards from Southern Scandinavia.

3.5.2 Whole coins and pendants

There are seven whole dirhams from Kaupang (Nos. 23, 26, 32, 38–40 and 44), and two more, which although reduced in size may have been whole when lost but have had their edges chipped or broken away (Nos. 48 and 63). Eight of these nine belong to the period 776–810, and five of these were found during the metal-detector survey of Area 2, raising the question whether they might be from a dispersed hoard. Three (Nos. 23, 32 and 40) were found within 20 m of each other just below the Viking-period shoreline, while the two others (Nos. 38–9) were 50 m up the slope above them and 20 m from one another, leaving a distribution that is inconclusive. Each of the other find groups produced no more than one whole coin (Tab. 3.14). The latest whole coins are dated 809/10 and 859/60.

Only two dirhams from the site show evidence of having been pierced to be worn as ornaments; one is whole (No. 44; Fig. 3.23) and one may have been whole when lost (No. 63). The Danish coin from Ribe (No. 11; Fig. 3.17.c), when found in 1960, showed evidence of formerly having had a soldered loop attached to wear as a pendant, but it appears subsequently have been cut up for use as bullion in a transaction. Other fragmentary coins may at some stage also have become ornaments and similarly reverted to a bullion role, but it is clear that the great majority of the coins that were lost at Kaupang had been held for their economic or metallic value, not worn as decoration.

3.5.3 Bending and nicking

Fifteen coins appear to have been deliberately bent (Nos. 13, 24–6, 28, 35, 37, 41, 52, 57–8, 71 and 85–7), probably to test the softness and hence the purity of the metal (Fig. 3.24). They span all periods.

Another form of secondary treatment often applied to 8th- and 9th-century Islamic coins found in Russia and Scandinavia is that of nicking (Fig. 3.25),

No. of nicks	No. of coins
1	7
2	5
3	1
4	2
5	1
6	0
7	0
8	1
9	0
10	1
	18

Table 3.15 *Degree of nicking on Islamic coins from Kaupang*

i.e. scratching short straight lines at edges, including the straight or broken edges of fragments (Welin 1956b:152). It is thought to have been applied in Russia, before the coins entered the Baltic zone, but the practice declined after 850, and it is rarely found on coins dated after 870 (Rispling 2004b:3–4). Nicking has been observed on 18 of the Kaupang coins (Nos. 12–14, 16, 27, 28, 39, 44–6, 55, 57–8, 61–2, 66, 68? and 69), although this number will have been depressed to some extent by the poor condition of many of the coins. The number of nicks per coin varies between one and ten (Tab. 3.15). The latest coins with nicks are an Abbasid dirham of 832/3 (No. 62), and three barely struck flans attributed to 844–869 (Nos. 66, 68 and 69). At Torksey, where the coins were much better preserved and the nicks more visible, 23 (36%) from a sample of 64 fragments were nicked. The similarity of these two samples compares with 18 (28–30%) out of some 60–65 coins from the same pre-870 period at Kaupang. This serves to emphasise the importance of the third quarter of the 9th century for the importation to Scandinavia of the dirhams that were lost at Kaupang.

3.5.4 Graffiti

One of the latest coins from the site, a Samanid dirham struck 951–955 (No. 85), has been incised with a design scratched into the surface (Fig. 3.26). Such pictorial and geometric graffiti are rare, but they do occur in hoards from Russia and Scandinavia, particularly of the 10th century (Welin 1956b; Dobrovolskij et al. 1981; Hammarberg and Rispling 1985). At first sight the design on No. 85 looks like a simple hollow T of a type that occurs as a graffito on a number of Viking-period coins (e.g. Hammarberg and Rispling 1985:nos. 30, 53, 62 and 95). This is generally interpreted as representing Thor's Hammer, an interpretation reinforced by the occurrence of the name **þur** in runes as a graffito on one coin (Hammarberg and Rispling 1985:68, fig. 92). However, on closer inspection the design has more to it than that. After the graffito was added, the coin was bent over and broken to form approximately a quarter of a coin and a short section of one broken side was folded over obscuring part of the graffito. The design continues under the fold and off the broken flan in such a way that one cannot satisfactorily photograph it. Below the hollow T there is a long base line, which is incised in the same manner as the T and appears to be part of the design, rather than a score-mark to divide the coin (which in any event was broken, not cut). Under and beyond the folded section there are two further lines at a right-angle that appear to intercept the base line at a point off the flan. The design could be composed of two adjoining elements, a Thor's Hammer and another uncertain pattern, or they may be part of a larger geometric design of which the hollow T is just an element.

Figure 3.23 *One of two dirhams from the site that had been adapted to be worn as a pendant, an Abbasid dirham temp. al-Amin (809–813), struck in 809/10 at Balkh in Afghanistan (No. 44). The reverse has two nicks at the edge of the coin. Photo, Lill-Ann Chepstow-Lusty, KHM.*

Figure 3.24 *One of several dirhams that had been deliberately bent, possibly to test the quality of their silver; an Abbasid dirham of Harun al-Rashid (786–809), struck in 795/6 at Bagdad in Iraq (No. 32). Photo, Lill-Ann Chepstow-Lusty, KHM.*

Figure 3.25 *Three nicks (scratches towards the edge, top left) on an Abbasid dirham of the period 844–869 (No. 66). Photo, Lill-Ann Chepstow-Lusty, KHM.*

Another coin – an Abbasid dirham of the mid-9th century (No. 67) – is less certainly inscribed with a graffito. The intersecting lines are rather weak (Fig. 3.27), but, since the surface of the coin is now quite corroded, they may previously have been a lot stronger and deeper. The marks do not form any obviously recognisable pattern, and, if they were applied deliberately by man, it is not clear that they were intended to have a meaning, rather than being mere doodles.

3.6 The coins found at Huseby

Four Viking-period or later medieval coins were found during the excavations at Huseby. Like all the datable finds there, they were in disturbed layers over the building platform. Perhaps surprisingly, none of them belong to the period when the hall is thought to have been in occupation, mid-8th to mid-10th centuries (Skre 2007e). Two of the coins are from the 11th century: an Anglo-Saxon penny of Harthacnut (second reign, 1040–1042) (Hu1) and a Cologne denier of Archbishop Sigwin (1079–1089) (Hu2). There is then a four-hundred-year gap before two small coins of the 15th and 16th centuries: a hvid of Kristian I of Denmark (1448–1481) (Hu3) and a 1559 Sechsling of Lübeck (Hu4). These four coins have been associated not with the hall, but with later occupation of the site, and the use of a smaller corner-timbered building *(stofa)* of which traces were found (Skre 2007e:243 and 246).

The English penny of Harthacnut is not an unusual find for Norway. In the 1040s the Norwegian currency was composed of a mixture of mainly German and English coins, although its presence on an isolated farmsted suggests that this had a special status. Harald Hardråde (1047–1066) introduced the first substantive national coinage, and initially his Triquetra pennies were of fine silver, but in due course his coinage was severly debased so that by c. 1060 the coins contained only one-third silver (Skaare 1976:79–85, 108). The effect of this was to drive the finer foreign coins out of circulation, and during the last third of the 11th century Olaf the Peaceful *(kyrri)* (1067–1093) succeeded in establishing a closed monetary system in which Norwegian coins completely dominated the currency (Malmer 1961:359–62; Skaare 1976:70–1, 108–13, 1995:45–54; Gullbekk 2003:34–9, 60). Thus in hoards such as those from Måge (Hordaland) and Gresli (Sør-Trøndelag), deposited in the late 11th century, 96% and 98% respectively of the coins were Norwegian. The Cologne denar of the 1080s from Huseby is therefore a very unusual find. Its fine standard of silver would make it more valuable than contemporary Nor-

Figure 3.26 *Graffito on coin no. 85. Photo, Lill-Ann Chepstow-Lusty, KHM.*

Figure 3.27 *Graffito on coin no. 67. Photo, Lill-Ann Chepstow-Lusty, KHM.*

wegian coins, but also incompatible with local currency, and if received in international trade it ought to have been taken to a mint for reminting into valid Norwegian coinage. With the principal mint located at Nidaros (Trondheim), with possibly one or two others elsewhere – Oslo and Bergen would be candidates – the process of exchanging foreign coin cannot have been easy, and would have involved intermediaries. It is likely, then, that the coin of Sigwin was going to be transmitted via a network to a mint, and Huseby may have had some role in that process. The presence of this and the coin of Harthacnut marks the site out as unusual, and supports Skre's suggestion that the *stofa* on *Husebyhaugen* may have been some kind of royal administrative farmstead (Skre 2007e:246–7).

3.7 Summary and conclusions

The coins discovered at Kaupang in the excavations of 1956–1974 provided sensational evidence for the use of coinage within a bullion economy in Norway during the 9th century. Those from the new excavations and surveys in 1998–2003 have greatly increased the coin-find data in both quantity and quality, and extended the date of the latest Viking-period coins known from the site by some 70 years, to the mid-10th century. As single finds, treated as accidental losses from circulation, these are prime evidence for the scale and use of currency. They form a fundamentally different type of evidence from hoards, which are deliberate deposits, affected more by social conditions and unexpected mortalities, resulting from violence or disease, than by changes in the economy.

The vast majority of the Kaupang finds were retrieved from disturbed layers representing the medieval or modern ploughsoil and hence lack any stratified archaeological context. Nonetheless, because on many parts of the site all the cultural deposits, including those of the early Viking Period had been ploughed out, the unstratified finds provide a sample from all periods of activity at Kaupang.

The finds were distributed across the entire length of the settlement (Fig. 3.20), but their spatial distribution cannot be closely analysed because there has been a drift in the ploughsoil eastwards towards and beyond the Viking-period waterfront and, in the centre of the site, northwards and southwards away from the rocky plateau (sect. 3.4). Those coins that were excavated from the later medieval plough-layer (the "black earth") on Blindheim's site and on the MRE site suffered less displacement, and show interesting correlations with other finds, notably hacksilver and weights. Among the finds from the metal-detector surveys of the modern ploughsoil, the coin distribution is broadly similar to that of other categories of artefact, in particular the hacksilver, suggesting that they were used for a variety of transactions and were not present primarily as raw material for silver working, although the crucible cake of partly molten coins and ornaments (Fig. 3.1) shows that they were used for this too. Only three coins show signs of having been converted into jewellery (sect. 3.5.2), emphasising that the vast majority of the coins lost on the site had an economic role.

The earliest coins are two Late-Roman bronze coins of the 4th century, which, with one or possibly two bronze Byzantine coins, are a somewhat exotic element probably brought to the site during the Viking Period (sect. 3.3.3). It is likely that they served as weights, or as raw material for metalworking in copper alloy, rather than functioning as money. Of course, in a bullion economy commodities other than precious metals could also have been exchanged in transactions.

The first coin to be lost on the site was probably a mid-7th-century Merovingian gold tremissis of Dorestad, one of only eight coins of this period known from Scandinavia. The others, all from Denmark, and mostly from mints in the Netherlands, form a coherent group distributed along or with access to the North Sea coastline, to which Kaupang would form a natural northern projection (Fig. 3.19). If lost during the later 7th or first half of the 8th century, as seems probable, it would represent the strongest evidence for some presence or activity on the site before the Viking Period and just pre-dating the high status site of Huseby.

The six Western silver coins all belong to the period c. 810–840 (sect. 3.3.2). Three Carolingian coins are deniers of Louis the Pious's *Christiana Religio* type, which is the most plentiful of the Carolingian issues in Scandinavian finds, and the scarcity of related coins of Louis successors indicates that they arrived in Scandinavia before Louis' death in 840. The two Anglo-Saxon coins, pennies of Coenwulf of Mercia (796–821), are marginally earlier and a local phenomenon. Only in Norway have Anglo-Saxon coins of the later 8th and early 9th centuries been found, and these are evidence of direct contacts across the North Sea during this limited period. The single Scandinavian coin from the site, a Nordic coin with a Wodan/Monster design and attributed to Ribe c. 825, again provides evidence of North Sea contacts.

Many of the dirhams found at Kaupang were of similar or earlier date to these Western coins, but this does not necessarily reflect their period of arrival. Although the earliest Islamic dirhams came to Scandinavia around 800, a comparison of the age-profile of the Kaupang coins with hoards deposited during the second half of the 9th century and with the finds from Torksey lost in the 870s (Fig. 3.14) indicates that the coins need not have started coming there before the mid-9th century, and that the third and fourth quarters were the most significant periods for their importation (above, 3.3.1). The limited stratigraphic evidence from the site supports this later dating. On the MRE and Blindheim's excavation site, only the earlier Viking-period layers (Site Periods I and II dating c. 800–840/50) survived intact. The only coins found in stratified contexts were three of the Western pennies – two Carolingian and one Anglo-Saxon. The case is strengthened by negative evidence from the MRE that despite careful investigation of the Phase I and II deposits, including sieving of all the spoil, no dirhams were found. It is argued here that there were two distinct phases of monetary circulation: the period c. 820–840/50 when the very few coins present in Kaupang were mainly Western silver ones from Francia, England and Denmark, and the second after the mid-9th century in which silver dirhams dominated the coinage almost entirely. This division was probably more pronounced in Southern Norway than elsewhere in Scandinavia, but there are indications that during the second quarter of the 9th century Carolingian coins enjoyed a degree of circulation elsewhere in Scandinavia, albeit alongside some dirhams. To see these principally as amulets brought by missionaries (Moesgaard 2004) is surely to underestimate their economic significance.

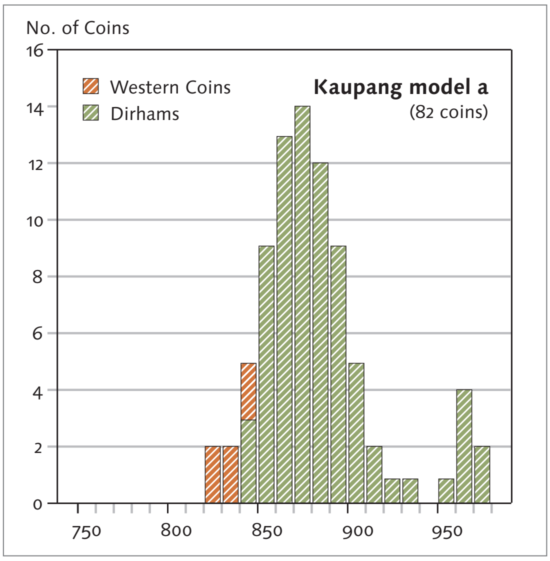
The 76 Islamic dirhams that can be assigned a date or date-range have a distinctive chronological pattern (Fig. 3.9), which has been compared with that shown by other sites and find groups (Figs. 3.10–12). One very clear difference is the proportion of 10th-century coins, which is much smaller at Kaupang than among any of the other sites or groups considered (Tab. 3.12). Monetary activity had decreased earlier at Kaupang than elsewhere, although it was still present to some degree until the third quarter of the 10th century.

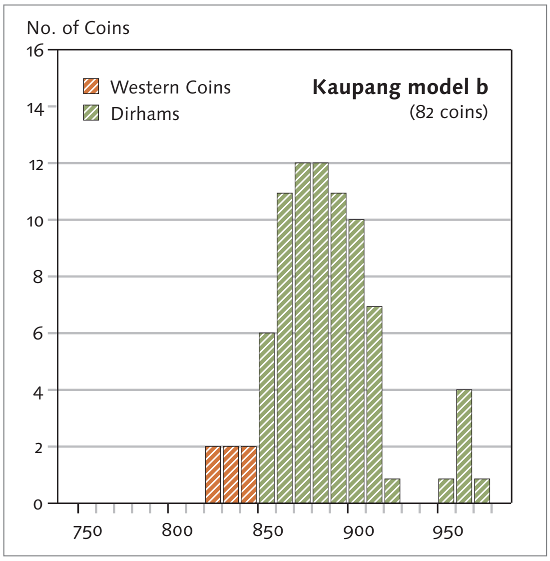
During the later 9th-century there was a marked decline in the volume of newly minted dirhams being imported into Eastern Europe and Scandinavia from

Figure 3.28a-b *Alternative models for the estimated rate of loss of coins at Kaupang, including the Western silver coins, based on Fig. 3.15.a and Fig. 3.15.b respectively.*

the Caliphate. Whether this resulted in a contraction in the coin-stock in Scandinavia is uncertain. Kilger (this vol. Ch. 7.6) argues that there was no such shortage and that this was indeed a period when coinage and bullion was plentiful, but the evidence is not conclusive. From c. 900 newly minted coins from the Samanid dynasty in Central Asia began to arrive and during the following decades they came to dominate the currency as reflected in the coin hoards. However, Callmer, Kyhlberg and others have questioned whether the hoards are representative of the currency circulating in the Scandinavian trading centres, arguing that stratified finds from Birka indicate that older, pre-Samanid coins remained in circulation longer than the hoards suggest. A review here (above, 3.2.7) of the evidence from the three principal excavation sites in Birka shows that it can be reconciled with the composition of coin hoards. However, hoards were selective to an extent, and many, as documented, have a much higher proportion of whole coins than is found among site finds, which are dominated by quite small fragments. The question of whether old coins were likely to be more fragmented than newer ones, resulting in the hoards having a different age profile from the site finds is considered (above, 3.2.6). In a sample of 10th-century hoards the degree of fragmentation was not found to be age related, and it is argued that the hoards can reasonably be taken as broadly representative of the coins being lost on settlements. The typical composition of the currency circulating in Scandinavia reflected by hoards, decade by decade, is shown in Table 3.7, and this has been used to estimate the rate of coin-loss on sites.

At Kaupang, coins of the 860s, 870s and 880s are well represented compared with other sites surveyed (Fig. 3.10), but after that there is a very significant reduction in the Kaupang finds with no coins of the 890s and far fewer of 900–920 than would be expect-





ed if the importation of coins had continued at anything like the earlier levels. A dramatic decline in the use of coinage in the settlement at Kaupang must have occurred sometime between 890 and 920. It may have been a gradual decline or it may have been a sharp change as a result of a single event. The number of 10th-century coins is remarkably few, a mere nine specimens, but they include a remarkable cluster of four coins struck between 945 and 955, evidently isolated finds from different parts of the site, which suggests there was an increase in activity in the late 950s or 960s. Some of the five other 10th-century coins were probably lost at this time as well. We cannot tell how long this final phase of monetary activity lasted, but the absence of German and Anglo-Saxon coins which were building up in Scandinavia during the 970s, 980s and 990s, would suggest that commercial activity there had ceased by c. 980 if not earlier.

For the first time an attempt has been made to represent estimates of the rate of loss of dirhams per decade over the life of this and other Scandinavian sites in order to study the changing levels of monetary activity (above, pp. 54–6). The estimates, presented as histograms, take account of cronological biases observed in the 8th- and 9th-century dirhams, and carry over into the 10th century a proportion of earlier coins to mirror the composition of the hoards. The process is not exact, and in some parts of the histograms the shape and extent of peaks and troughs could to some extent be adjusted, but for each the overall form and weighting should be valid. The estimates for Uppåkra, Paviken and Birka's 1990–1995 Black Earth excavations (Fig. 3.16.a–c) each have very different profiles, showing that their periods of monetary activity varied considerably. A fourth model, based on a sample of single finds from Southern Scandinavia (Fig. 3.8.b), not dominated by any one site, provides a control against which to compare and interpret the site patterns.

For Kaupang alternative models have been developed reflecting the possible range of variation in the date and intensity of the decline in monetary activity between 890 and 920 (Fig. 3.15.a–c). They starkly demonstrate the difference in the level of monetary activity in the second half of the 9th century and early 10th century compared in particular with the second quarter of the 10th century, and this pattern is in complete contrast to that of the Paviken and Birka Black Earth sites that have their heyday in the mid-10th century. By adding the Western coins (Fig. 3.28), we can present a full picture of the use of coinage on the settlement at Kaupang, but again showing a range of interpretations with Figure 3.28.a representing a more prolonged decline, starting in the late 9th century, and Figure 3.28.b the latest postponement of the decline that this form of modelling will reasonably support.

These coins, most of which had been finely divided into fragments, were used in a mixed bullion economy, along with other whole and fragmented silver artefacts. The plentiful finds of hacksilver from the Kaupang site, which are studied by Hårdh (this vol. Ch. 5), are more difficult to date than the coins. Some hacksilver was found in the earlier stratified contexts in Phase II, indicating that it was already in use before 840/50, but most of the pieces from the ploughsoil were no doubt contemporary with the subsequent dirham-using phase. It has been estimated in this chapter (sect. 3.2.5) that there was a high rate of wastage (5–7.5% p.a.) from the currency in Southern Scandinavia in the early 10th century, and a significant contributor to this would have been the melting down of coins to form ingots and ornaments. Similar or even higher rates of wastage may well have applied in the later 9th century when the non-coin element of silver hoards is particularly high.

The finds from Kaupang provide extraordinarily rich evidence for the use of coins and silver in exchange transactions in Norway during the 9th century. Although around 11,000 other coins of the Viking Period have been found in Norway, less than one per cent of these were struck during the 8th or 9th centuries, and a significant number of those are from graves, have been mounted as ornaments, or are from hoards of the 10th century (Skaare 1976: 47–8). By the time these categories have been discounted, and also coins with very vague find circumstances, there is very little substantive evidence for the active use of coins as a medium of exchange in Norway before 900 (Blackburn 2005a:143–5). The only substantial hoard is that from Hoen, consisting of a rich collection of gold and gilt ornaments, including 20 coin pendants. By contrast, to find at Kaupang 101 single finds on one site, mostly lost during the 9th and early 10th centuries, is evidence of intense economic activity, and the more so when the coins and accompanying hacksilver are finely divided (Hårdh 1996:24–7). Kaupang's find record is comparable in many respects with those of other well-known sites in Northern and Western Europe. Although direct quantitative comparisons between sites cannot be made, because the circumstances for recovery and recording will have varied so much, it is reasonable to conclude that exchange activities at Kaupang were of a similar nature to those at other 9th-century emporia. It remains to be seen whether this was the only site in Norway where bullion was so actively handled, and whether it fed into a distribution network in the hinterland and further afield in which bullion was also used a means of exchange.

Appendices

Data on which find histograms are based

These tables present the data on which the discussions and various histograms in this chapter are based. The first (App. 3.1) shows the number of dirhams by date of production from each site, group or hoard divided by decade. Many of the site finds, being fragments, can only be dated to within a few years or a few decades, but without these the samples would often be too small for interpretation. These coins have, therefore, been included in the distributions by assigning an appropriate proportion to each year of the period to which they are attributed (see above, p. 47). This will have had a smoothing effect reducing the peaks and troughs that might otherwise have occurred had each coin been precisely dated.

The second (App. 3.2) shows number of dirhams lost per decade on various sites, as derived from the models developed in this chapter (3.3.1, pp. 54–6).

Appendix 3.1

Distribution of dirhams from various sites and hoards, by date of production

Dates	Kaupang	S Scandinavia 1–5 coins	S Scandinavia All sites	Uppåkra	Paviken	Birka Harbour	Birka Ramparts	Birka 1990–1995	Torksey	Loftahammar Hoard	Roma Hoard	Grimestad Hoard	Bräcke Hoard	Erikstorp Hoard
pre-750	4 (5.3%)	3	3	15	8.5	7	1	1	7.0	70	10	-	-	1
750–759	3.1 (4.1%)	1	1	2.7	0.8	1	-	1.1	2.5	11	1	-	-	-
760–769	2.1 (2.8%)	3	3.1	9.6	1.3	-	0.1	0.2	7.1	19	3	-	-	-
770–779	7.8 (10.3%)	6	13	25	8.5	1.3	2.2	2.9	7.1	54	9	-	-	-
780–789	6.4 (8.4%)	3	6.9	18	5.6	0.3	1.7	1.3	7.7	40	4	-	-	-
790–799	4.1 (5.4%)	4	4	22.6	4.1	0.3	3.2	0.9	6.2	35	5	1	-	-
800–809	13.5(17.7%)	8	10	34.4	5.9	0.1	1.1	4.2	9.5	148	21	1	1	-
810–819	6.9 (9.1%)	3	8	15.2	3	0.1	0.3	0.7	6.2	67	8	1	1	-
820–829	1.5 (2%)	1	2	5.5	1.6	0.1	1.6	2.8	1.8	18	3	-	-	-
830–839	1.9 (2.5%)	-	-	5.4	2.4	0.1	1.4	0.1	1.8	32	9	-	1	-
840–849	2.8 (3.7%)	-	-	5	1.6	0.1	1.2	0.6	2.2	32	20	-	-	-
850–859	4.7 (6.2%)	2	3	4.5	2.8	0.1	1.2	1	3.3	57	27	1	1	-
860–869	4.3 (5.7%)	1	2.2	4.5	2.8	0.1	1.8	1	4.7	40	31	2	2	-
870–879	2 (2.6%)	-	0.3	1.6	0.8	1	0.2	0.1	-	-	21	2	-	-
880–889	1.8 (2.4%)	-	0.3	1.6	0.8	1	-	0.1	-	-	16	-	-	1
890–899	-	4	5.5	2.8	5.2	-	3.2	4.7	-	-	1	9	11	11
900–909	3.7 (4.8%)	13.3	18.8	17.5	5.8	0.5	3.5	4.4	-	-	-	37	20	65
910–919	0.7 (0.9%)	4.7	6.7	7.1	8.8	2.2	1.4	8.1	-	-	-	18	17	52
920–929	0.2 (0.3%)	3	5	5.4	10.5	1.3	1.5	8.4	-	-	-	3	3	41
930–939	0.2 (0.3%)	2	3	8.4	11.8	-	2.5	5.2	-	-	-	-	1	28
940–949	2.2 (2.8%)	2	3.8	4.1	10.5	1	-	6.7	-	-	-	-	-	10
950–959	2 (2.6%)	1	1.5	6.3	5	-	-	3.1	-	-	-	-	-	5
960–969	-	-	-	0.9	0.16	-	-	2.6	-	-	-	-	-	-
post-970	-	1	1	0.5	-	-	-	-	-	-	-	-	-	-
	76	**66**	**102**	**224**	**108**	**18**	**29**	**61**	**67**	**623**	**185**	**75**	**58**	**214**
No i.d.	14	133	163			0	20	7	1	1378	216	2		92
Total	90	199	265			18	49	68	67					
T.p.q.										c. 865	c. 895	921	933	956

Appendix 3.2
Estimates of coin-loss by decade for dirhams from various Scandinavian sites

Dates	Kaupang (model a)	Kaupang (model b)	Kaupang (model c)	Scandinavia sites with 1–5 coins	Uppåkra	Paviken	Birka Black Earth 1990–1995
800–809	-	-	-	1	2	1	1
810–819	-	-	-	1	3	-	-
820–829	-	-	-	1	5	1	-
830–839	-	-	-	1	12	-	-
840–849	3	-	-	2	20	1	2
850–859	9	6	8	3	22	2	-
860–869	13	11	12	4.25	23	4	1
870–879	14	12	12	4.25	23	6	1
880–889	12	12	12	4.25	20	8	1
890–899	9	11	12	4.25	17	9	2
900–909	5	10	11	5	14	9	3
910–919	2	7	-	6	12	9	6
920–929	1	1	-	6	12	10	7
930–939	1	-	-	6	11	12	8
940–949	-	-	-	6	10	14	9
950–959	1	1	2	5	9	14	10
960–969	4	4	5	4	6	6	7
post-970	2	1	2	2	3	2	3
	76	76	76	66	224	108	61

Catalogue of the Coins

4

GERT RISPLING, MARK BLACKBURN
AND KENNETH JONSSON

This catalogue lists 101 single-finds and a molten silver hoard from excavations and surveys on the settlement site at Kaupang 1959–2002, excluding late medieval and modern coins that have no bearing on the Viking-age site. It also lists at the end the four coins found in excavations at Huseby during 2000–2001.

The coins were sent to Stockholm in 2002 where they were identified by Gert Rispling (Islamic) and Kenneth Jonsson (Western). Mark Blackburn subsequently studied them in Oslo, and he has been responsible for the final form of the catalogue, and adding details about their state, secondary treatment and find circumstances. The task of identifying Islamic coins from fragmentary specimens such as those here is considerable, and Gert Rispling (2004a:31–39) describes some of the problems and techniques he has developed with many years of experience.

The coins are described as follows: Column 1: catalogue no.; Column 2: probable production date (AD); Column 3: mint; Column 4: metal and denomination (except Islamic, which are all silver dirhams); type; mint reading (in square brackets if off the flan or illegible, or in parentheses if not named but implied); Hijra date inscribed on coin (Islamic only); description; reference (in parentheses); weight; comments on whether whole or fragmented, physical state and any secondary treatment; any publication of this coin; Column 5: find circumstances, context and date; find number. The term 'nick' is used here to indicate straight scratches at the edge of the coin, as defined in Welin 1956b:152, and used in the *CNS* series. Within each series the coins are listed in chronological order. All the coins are illustrated on pages 88–93.

The coins are all deposited in the Coin Cabinet of the Cultural History Museum (Kulturhistorisk museum) of Oslo University.

4.1 Coin finds from the settlement site

Cat. no.	Production date (AD)	Mint	Description	Find context and no.
ROMAN Constantine I (307–37)				
1	321	Trier (Germany)	Copper-alloy, Æ 3, mint mark //STR (*RIC* VII, 190.303). 1.27 g, whole coin, chipped. See Blackburn, this vol. Ch. 3:Fig. 3.18.a.	MRE, later medieval plough-layer, 2001; C52519/14914 (F1014067).
Valentinian I (364–75)				
2	367–75	Arles (France)	Copper-alloy, Æ 3, mint mark OF [?]//CON (*RIC* IX, 66.16, (a).XIII (a–c); *LRBC* 518). 1.40 g, whole coin, heavily corroded and chipped.	Blindheim excav., medieval plough-layer, 1964; fnr 1022a.
BYZANTINE?				
3	8th/9th cent.?	Uncertain mint	Copper-alloy, uncertain attribution, probably a follis of the 8th–9th cent. 1.97 g (heavily corroded), *c.* 20 mm diam. (originally *c.* 24 mm?). This is the core of a copper-alloy coin, the original struck surface having corroded away. However, some features of the design are visible, namely a facing bust with a hatched tunic and wearing a crown with pendelia, surrounded by a circular inscription now illegible.	MRE, modern ploughsoil, 2001; C52519/14011 (F1008918).
4	9th/10th cent.?	Uncertain mint	Copper-alloy, uncertain attribution, possibly a follis of the 9th or 10th cent. 2.53 g (fragment, *c.* 40% remaining; originally *c.* 7 g and *c.* 25–30 mm diameter). The fabric would be consistent with a Byzantine follis of the 9th or 10th century, but the patterns visible on it do not allow a convincing attribution to be made; it could be an object other than a coin.	MRE, modern ploughsoil, 2002; C52519/17199 (F1022963).
MEROVINGIAN				
5	*c.* 650	Dorestad (Netherlands) or uncertain Frisian mint	Gold tremissis, moneyer Madelinus (Prou 1896:no. 1226). Obv. ΔORESTAT FIT, bust right; rev. MAΔELINVS M, cross on step. 1.25 g; no sign of wear, small crack and edge chip probably caused by fatigue in ground; metallic content not measured, but probably *c.* 30–40% gold, *c.* 60–70% silver. This belongs to a large group of coins with a very stylised form of design that is derived from the earlier and finer Dorestad coins of the moneyer Madelinus. Pol (1990) identifies these as derivatives struck at unknown places in Frisia. See Blackburn, this vol. Ch.3:Fig. 3.18.b.	M-d survey, area 1B, modern ploughsoil, 2001; C52517/2254 (F55259).
CAROLINGIAN Louis the Pious (814–40)				
6	822/3–840	Uncertain mint	Silver denier, Temple type (Morrison and Grunthal 1967:no. 472). Obv. +HLVDOVVICVS IMP, cross and four pellets, rev. XPISTIANA RELIGIO, temple. 0.86 g, whole coin, chipped and corroded. Skaare 1963:151–2, fig. 1; Skaare 1976:pl. IV, 2. See Blackburn, this vol. Ch. 3:Fig. 3.17.b.	Blindheim excav. 1962, fnr 932a.

Cat. no.	Production date (AD)	Mint	Description	Find context and no.
7	822/3–840	Uncertain mint	Silver denier, Temple type (Morrison and Grunthal 1967:no. 472). Obv. [ ]HLV[ ], cross, probably with pellets in angles, rev. [ ]RELIGIO, temple. 0.35 g, whole but heavily chipped and corroded.	MRE, 2001, from a stratified context (Site Period II) in an occupation deposit immediately below the later medieval plough-layer on plot 4B in the MRE; C52519/13642 (F1015134).
8	822/3–840	Uncertain mint	Silver denier, Temple type (Morrison and Grunthal 1967:no. 472). Obv. [ ]HLV[ ], cross, probably with pellets in angles, rev. [ ]TIA[ ], temple. 0.15 g, fragment, corroded. Skaare 1960a:fig. 2.	Blindheim excav. 1959, found within 20 cm of no. 10, and on the same day, but while there is no information about whether they are from the same context, the coordinates suggest it is likely that they both derive from an intact deposit under the inner stone line of Blindheim's "house 1"; fnr 677b.
ANGLO-SAXON Coenwulf of Mercia (796–821)				
9	*c.* 800–15	East Anglia (England)	Silver penny, Early Portrait type, moneyer Lul (Blunt et al. 1963: Cn 97–98). Obv. [ ]F / REX [ ], bust; rev. .+ /.I / [ ] / [ ] / -: , in arms of cross. 0.45 g, fragment, very corroded, surface flaking.	Blindheim excav. 1965; fnr 1031a.
10	*c.* 810–21	East Anglia (England)	Silver penny, Portrait/Annulet Cross type, moneyer Wodel (Blunt et al. 1963:Cn 111e). Obv. COENVVLF / R[EX] M, bust right, rev. PO d E L+ (P and L inverted), in angles of annulet cross. 0.54 g, whole coin, corroded and chipped. Skaare 1960a:fig. 1. See Blackburn, this vol. Ch. 3:Fig. 3.17.a.	Blindheim excav. 1959, found within 20 cm of no. 8, and on the same day, but while there is no information about whether they are from the same context, the coordinates suggest it is likely that they both derive from an intact deposit under the inner stone line of Blindheim's "house 1"; fnr 677a.
DANISH				
11	*c.* 825–40	Ribe (Denmark)	Silver penny, "Wodan/Monster" type (Malmer 1966, KG 5, Hjort B1/Strålans A2, pl. 2:9/3:6, as Hedeby; for the attribution to Ribe see Metcalf 1996: 416–19). 0.45 g, fragment; now broken sides, but see comment below; formerly mounted as an ornament? Skaare 1960b, 1963:152–3, fig. 2; Malmer 1966:283, no. 115; Skaare 1976:45–46, pl. X, 4. Skaare (1963:154) comments "there are traces of a lost loop on this coin, but as it now appears deliberately cut, it seems likely that it served as payment not as an ornament, when it finally was put away or dropped into the soil at Kaupang". The design on both sides has been damaged at a point (270° on obverse and 360° on reverse, see Blackburn, this vol. Ch. 3:Fig. 3.17.c.), suggesting an attachment may have been soldiered to the coin at that point. The edges have been further chipped to some extent since the coin was found and illustrated in Skaare 1963:fig. 2, so that now the coin does not give the appearance of having been cut.	Blindheim excav. 1960; fnr 721a.

Cat. no.	Production date (AD)	Mint	Description	Find context and no.
ISLAMIC (All coins are silver dirhams) UMAYYAD DYNASTY (H 41–132/AD 661–750)				
12	698–718	Uncertain mint	Mint?, [79–99]. Tiny script, early. 0.29 g, fragment; one nick by edge.	MRE, later medieval plough-layer, 2001; C52519/15422 (F1012720).
13	733/734	Wasit (Iraq)	Wasit, [1]15. 1.07 g, fragment; long side cut, short side broken; one nick by edge; bent once.	M-d survey, area 2, modern plough soil, 2001; C52517/2545 (F55582).
14	698–750	Uncertain mint	Mint?, [79–132], 0.62 g, fragment; corroded, one cut and one broken edge, two nicks by edge.	MRE, later medieval plough-layer, 2001; C52519/15138 (F1017504).
15	698–750	Uncertain mint	Mint?, [79–132], 0.24 g, fragment.	MRE, later medieval plough-layer, 2001; C52519/14370 (F1013459).
ABBASID DYNASTY (H 132–656/AD 749–1258) Uncertain caliph *(temp.* al-Saffah (H 132–6/AD 749–54) or al-Mansur (H 136–58/AD 754–75))				
16	752–756	Basra (Iraq)	[al-Basra], [*c.* 135–38]. 0.30 g, fragment; broken sides; one nick by edge.	MRE, modern plough soil, 2001; C52519/14456 (F1011816).
17	750–764	Uncertain mint	Mint?, [132–46]. Rev: *Muhammad /rasul /Allah.* 0.48 g, fragment.	M-d survey, area 2, plough-layer, 2000; C52517/882 (F990866).
18	750–764	Uncertain mint	Mint?, [132–46]. Rev: ring visible. 0.35 g, fragment; broken or chipped edges, corroded. Skaare 1963:153, fig. 5.	Blindheim excav. 1960; fnr 721b.
Temp. al-Mansur (H 136–58/AD 754–75)				
19	769/770	Baghdad (Iraq)	[Madinat al-Salam], [1]52. Rev: *M/R/[A]/[bakh].* 1.16 g, fragment.	M-d survey, area 2, plough-layer, 2002; C52517/1874 (F105266).
Temp. al-Mansur with al-Mahdi as heir (H 145–55/AD 769–72, in al-Rayy/al- Muhammadiyya only)				
20	769–772	Teheran (Iran)	[al-Muhammadiyya], 1[52–55]. Rev: a dot. 1.30 g, fragment; bent once.	M-d survey, area 2, plough-layer, 2001; C52517/2163 (F55161).
Temp. al-Mansur, cont.				
21	772–775	Baghdad (Iraq)	Madinat al-Salam, [156–58]. Rev: *M/R/A/bakh [bakh].* 0.70 g, fragment; long side cut, short side recent break.	MRE, modern plough soil, 2001; C52519/14028 (F1008959).

Cat. no.	Production date (AD)	Mint	Description	Find context and no.
al-Mahdi (H 158–169/AD 775–785)				
22	778/779	Uncertain mint	Mint?, [1](6?)2. Rev: corroded and obliterated. 0.54 g, fragment; one side cut, one broken.	M-d survey, area 2, modern plough soil, 2001; C52517/2557 (F55594).
23	779/780	Baghdad (Iraq)	Madinat al-Salam, 163. Rev: dot//2 dots. 2.33 g, whole.	M-d survey, area 2, modern plough soil, 2001; C52517/2155 (F55153).
24	775–782	Baghdad (Iraq)	[Madinat al-Salam], 1[59–65]. Rev: *[alMahdi]*. 0.44 g, fragment; two cut sides, one recent chip; bent once.	M-d survey, area 1B, modern plough soil, 2000; C52517/165 (F990104).
al-Mahdi with Harun as heir (H 164–9/AD 780–5, in Africa and Anatolia only)				
25	784/785	Harunabad, (Turkey)	Harunabad, [1](68). Obv: very corroded. Rev: *(Arminiya)/ alKhalifa alMahdi /mimma amara bihi Harun /bin amir alMu'minin/Hasan.* A scarce coin. 0.75 g, fragment; edge folded over double.	M-d survey, area 2, modern plough soil, 2002; C52517/1907 (F105302).
Uncertain caliph				
26	776–787	Kairouan (Tunisia)	(al-'Abbasiyya), (*c.* 160–70). Rev: *bakh/M/R/A/Yazid.* 1.70 g, whole, bent into an open curl; corroded.	M-d survey, area 1A, modern plough soil, 2002; C52517/1731 (F105101).
27	776–787	Kairouan (Tunisia)	[al-'Abbasiyya], [*c.* 160-70]. Rev: *o/M/R/A/[Yazid].* 0.72 g, fragment; obv. one nick by edge, one by side, rev. two nicks by side.	M-d survey, area 2 (but over the MRE site), modern plough soil, 2000; C52517/732 (F990709).
28	776–787	Kairouan (Tunisia)	[al-'Abbasiyya?], [*c.* 160–70]. Rev: *[...]/[Yazid].* 0.56 g, fragment; two sides cut, one broken; obv. three nicks by cut edges; rev. two nicks by cut edges; bent once.	M-d survey, area 1B, modern plough soil, 2000; C52517/131 (F990061).
29	776–787	Kairouan (Tunisia)	[al-'Abbasiyya], *c.* 1[60–70]. Rev: *o/M/R/A/[Yazid].* 0.43 g, fragment.	M-d survey, area 1B, modern plough soil, 2001; C52517/2303 (F55310).
30	776–790	Teheran (Iran)	[al-Muhamma]diyya, [160–73]. Rev: *MR /A salla Allah /`alayhi wasallama /alKhalifa alMahdi.* 0.41 g fragment.	MRE, modern plough soil, 2001; C52519/14358 (F1013223).
CONTEMPORARIES OF THE IDRISIDS Khalaf bin al-Muda' (H 175–6/AD 791–2)				
31	792/793	Tudgha (Morocco)	[Tudgha], 1[76]. Rev: *Khalaf /M/R/A /[Khalaf].* 1.20 g, fragment; long edge cut, short edge broken.	M-d survey, area 1B, modern plough soil, 2000; C52517/550 (F990507).

Cat. no.	Production date (AD)	Mint	Description	Find context and no.
ABBASID (cont.) Harun al-Rashid (H 170–193/AD 786–809) with al-Amin as heir (H 175–193/AD 791–809, at several mints)				
32	795/796	Baghdad (Iraq)	Madinat al-Salam, 179. Rev: *MRA /mimma amara bihi alAmir alAmin /Muhammad bin amir alMu'minin /Ja`far.* 2.73 g, whole; bent double, well-preserved inside the fold. See Blackburn, this vol. Ch. 3:Fig. 3.24.	M-d survey, area 2, modern plough soil, 2001; C52517/2046 (F55044).
33	798/799	Balkh (Afghanistan)	[Madinat Balkh], [c.182]. 0.79 g, fragment.	M-d survey, area 3, modern plough soil, 2000; C52517/629 (F990594).
Harun al-Rashid, alone (H 170–193/AD 786–809)				
34	802/803	Baghdad (Iraq)	[Madinat al-Salam] (187). Rev: *M/R/A*—. 1.50 g, fragment.	CRM, later medieval plough-layer, 2000; C52516/4031 (F1004371).
35	802/803	Baghdad (Iraq)	[Madinat al-Salam], 18[7]. Rev: *M/R/A/*—. 1.17 g, fragment; bent once.	M-d survey, area 1A, modern plough soil, 2000; C52517/351 (F990299).
36	803/804	Baghdad (Iraq)	[Madinat al-Sa]lam, 188. Rev: *M/R/A/ha'.* 0.64 g, fragment; corroded, chipped edges, cracked.	M-d survey, area 2, modern plough soil, 2000; C52517/946 (F990933).
37	803/804	Teheran (Iran)	(al-Muhammadiyya), 1(88). Rev: *M/R/A/ha'.* 2.17 g, whole, folded in half; well preserved inside, but corroded outside; a narrow slot cut through bent profile.	M-d survey, area 2, modern plough soil, 2000; C52517/851 (F990835).
38	804/805	Baghdad (Iran)	Madinat al-Salam, 189. Rev: *M/R/A/ha'.* 2.30 g, whole but chipped.	M-d survey, area 2 (but over the MRE site), modern plough soil, 2000; C52517/741 (F990719).
39	804/805	Teheran (Iran)	al-Muhammadiyya, written 'al-Hamdiyya', 189. Rev: *M/R/A/ha'.* 2.83 g, whole; obv. one nick at edge, rev. one nick at edge.	M-d survey, area 2, modern plough soil, 2001; C52517/2062 (F55060).
40	804/805	Teheran (Iran)	(al-Muhammadiyya), (189). Rev: *M/R/A/ha'.* 2.49 g, whole, corroded.	M-d survey, area 2, modern plough soil, 2000; C52517/858 (F990842).
41	805/806	Balkh (Afghanistan)	[Madinat Balkh], [190]. Rev: *[MRA] /mimma amara bihi alAmir alMa'mun] /[`Abdallah bin amir alMu'minin wali] /[`a]hd [alMuslimin] /`ayn (initial).* Attribution by Lutz Ilisch, Tübingen. 0.46 g, fragment; bent double at point of triangular fragment.	M-d survey, area 3, modern plough soil, 2000; C52517/54 (F28720).
42	807/808	al-Rafiqa (Syria)	al-Rafiqa, [19]2. Rev: *M/R/A/ra'.* A scarce coin. 0.87 g fragment, corroded; broken.	M-d survey, area 1B, modern plough soil, 2002; C52517/1825 (F105211).

Cat. no.	Production date (AD)	Mint	Description	Find context and no.
43	803–809	Teheran (Iran)	al-Muhammadiyya, [188–93]. Rev: *M/R/A/[...].* 0.41 g, fragment.	M-d survey, area 3, modern plough soil, 2000; C52517/62 (F28728).
Temp. al-Amin (H 193–8/AD 809–13), in the name of al-Ma'mun				
44	809/810	Balkh (Afghanistan)	Madinat Balkh, 194. Rev: *MRA /mimma amara bihi alAmir alMa'mun /wali `ahd alMuslimin /`Abdallah bin amir alMu'minin.* 2.69 g, whole, pierced for suspension; on rev. two nicks by edge; buckled but probably not deliberately. See Blackburn, this vol. Ch. 3:Fig. 3.23.	M-d survey, area 3, modern plough soil, 2000; C52517/668 (F990639).
45	811/812	Samarkand (Uzbekistan)	[Madinat Sa]marqand, [19]6. Rev: *MRA /mimma amara bihi alImam /alMa'mun amir alMu'minin.* 0.39 g, fragment; broken sides; one nick by edge.	MRE, modern plough soil, 2001; C52519/14833 (F1009202).
Uncertain caliph				
46	786–815	Uncertain mint	Mint?, 1[70–99]. Rev top: *...âm?.* 0.34 g, fragment; two nicks.	M-d survey, area 2, modern plough soil, 2000; C52517/795 (F990776).
47	809–815	Samarkand (Uzbekistan)	[Madinat Samarqand], 19[4], 19[7] or 19[9]. Rev: *lillah /mimma amara bihi [alAmir/alImam alMa'mun] /....* Struck in the name of al-Ma'mun as caliph of the East or the whole caliphate. 0.58 g, fragment.	M-d survey, area 2, modern plough soil, 2002; C52517/1896 (F105289).
48	750–816	Uncertain mint	Mint?, [132–200]. 1.04 g, large fragment (*c.* 80% of coin); heavily corroded, perhaps whole when lost, chipped edges.	Blindheim excav. 1964; fnr 1022e.
49	750–816	Uncertain mint	Mint?, [132–200]. 0.94 g, fragment; very corroded; one side cut, one side broken.	M-d survey, area 1A, modern plough soil, 2000; C52517/341 (F990289).
50	750–816	Uncertain mint	Mint?, [132–200]. 0.47 g, fragment; one nick by side; sides probably broken.	M-d survey, area 1A, modern plough soil, 2000; C52517/308 (F990254).
51	750–816	Uncertain mint	Mint?, [132–200]. 0.27 g, fragment; heavily corroded, broken into three pieces.	Blindheim excav. 1964; fnr 1022g.
52	750–816	Uncertain mint	Mint?, [132–200]. 0.14 g, fragment; bent once.	M-d survey, area 1B, modern plough soil, 2000; C52517236 (F990177).
53	750–816	Uncertain mint	Mint? [132–200]. 0.11 g, fragment.	MRE, later medieval plough-layer, 2001; C52519/14341 (F1012859).
54	775–816	Uncertain mint	Mint?, [159–200]. 0.34 g, fragment; very corroded.	M-d survey, area 1B, modern plough soil, 2001; C52517/2428 (F55461).

Cat. no.	Production date (AD)	Mint	Description	Find context and no.
55	775–816	Uncertain mint	Mint?, [159–200]. 0.26 g, two fragments; four nicks on one side, none on the other.	M-d survey, area 1B, modern plough soil, 2000; C52517/124 (F990053).
56	805–816	Uncertain mint	Mint?, [*c.*190–200]. Rev: *[...]/M/R/A/[...]*. 0.38 g, fragment.	M-d survey, area 1B, modern plough soil, 2001; C52517/2368 (F55391).
Temp. al-Ma'mun (H 198–218/AD 813–833)				
57	814–816	Samarkand (Uzbekistan)	Madinat Samarqand, [199–200]. Rev: *L/M/R/A/[Dhu lRiyasa]tayn.* 0.75 g, fragment; bent once; obv. five nicks, rev. five nicks.	M-d survey, area 1B, modern plough soil, 2000; C52517/389 (F990338).
58	815/816	Samarkand (Uzbekistan)	[Madinat Samarqand], 200. Rev: *[L]/M/R/A/[Dhu l]Riyasatayn.* 0.74 g, fragment; about half a coin, bent over double; two nicks.	MRE, modern plough soil, 2001; C52519/15088 (F1009538).
59	811–820	Teheran (Iran)	al-Muhammadiyya, [196–204]. Rev: *[Dhu lRiya]satayn.* 0.56 g, fragment.	M-d survey, area 1B, modern plough soil, 2002; C52517/1690 (F105053).
60	815–826	Uncertain mint	Mint?, 2[00–10]. 0.52 g, fragment.	M-d survey, area 2, modern plough soil, 2001; C52517/2015 (F55013).
TAHIRID Talha (H 207–213/AD 822–828), and Caliph al-Ma'mun				
61	823–826	Samarkand (Uzbekistan)	Samarqand, [208–10]. Rev: *[Muhammad rasul] / [Allah alMa'mun] /[khalifat Allah] /[Talha].* 1.11 g, fragment; obv. four nicks, rev. four nicks .	M-d survey, area 1A, modern plough soil, 2000; C52517/343 (F990291).
ABBASID (cont.) *Temp.* al-Ma'mun (cont.)				
62	832/833	Samarkand (Uzbekistan)	Samarqand, [21]7. Rev: *L/M/R/A/—-*. 0.80 g, fragment; one nick at edge.	MRE, modern plough soil, 2001; C52519/14840 (F1009214).
al-Mutawakkil (H 232–247/AD 847–861) with al-Mu`tazz as heir (H 240–47/AD 854–61)				
63	859/860	Merv (Turkmenistan)	Marw, 2(4)5. Obv: *(alMu`tazz billah).* Rev: *L/M/R/A/alMutawakkil `ala llah.* 1.40 g, fragment; perhaps whole when lost, edge broken or chipped; pierced for suspension.	MRE, later medieval plough-layer G41007/AL37654, 2001; C52519/14202 (F1012988).
64	855–861	Tashkent (Uzbekistan)	al-Shash, [241–46]. Obv: *alMu`tazz billah.* Rev: *(alMutawakkil `ala llah).* 1.17 g, fragment; two cut sides, a third broken by bending.	M-d survey, area 2, modern plough soil, 2000; C52517/1001 (F990995).

Cat. no.	Production date (AD)	Mint	Description	Find context and no.
ALID of Tabaristan, also called ZAYDID al-Hasan bin Zayd (H 250–70/AD 864–84)				
65	867	Amol (N Iran)	(Amul), [253]. Obv: *alDa`i ila lhaqq* (he who calls for the truth). Outer circular legend Koran 42:23. Rev: *L/M/R/A /alHasan bin Zayd.* Circular legend Koran 22:39. 2.07 g, fragment.	M-d survey, area 2 (but over the MRE site), modern plough soil, 2000; C52517/728 (F990703).
ABBASID (cont.) Uncertain caliph (nearly blank flans due to worn-out dies, from mints in Uzbekistan and Iran (Rispling 2004a:34)).				
66	844–869	Uzbekistan or Iran	Mint?, *[c.* 230–55]. 1.20 g, cut half, three nicks at edge. Skaare 1963:152–3, fig. 3. See Blackburn, this vol. Ch. 3:Fig. 3.25.	Blindheim excav. 1960; fnr 723a.
67	844–869	Uzbekistan or Iran	Mint? *[c.* 230–55]. 1.05 g, fragment; faint scratches perhaps representing a graffito, originally stronger as the surface is corroded (see discussion in Blackburn, this vol. Ch. 3:68 and Fig. 3.25).	M-d survey, area 2 (but over the MRE site, not shown on Fig. 3.20 because exact find location is uncertain), 2002; C52517/1637 (F1035632).
68	844–869	Uzbekistan or Iran	Mint?, *[c.* 230–55]. 0.70 g, fragment; heavily corroded, one nick?, possibly two cut edges originally.	M-d survey, area 2, modern plough soil, 2002; C52517/1865 (F105256).
69	844–869	Uzbekistan or Iran	Mint?, *[c.* 230–55]. 0.45 g, fragment; broken edges, one nick.	M-d survey, area 1A, modern plough soil 1999; C52264/126 (F940463).
70	844–869	Uzbekistan or Iran	Mint?, [*c.* 230–55]. 0.24 g, fragment; one edge cut.	M-d survey, area 2, modern plough soil, 2001; C52517/2014 (F55012).
71	844–883	Uzbekistan or Iran	Mint?, 2[30–69]. Rev: *[L]/M/R/A/[....]* llah. 1.03 g, fragment; bent twice and flattened.	M-d survey, area 2, modern plough soil, 2001; C52517/2031 (F55029).
al-Mu`tamid (H 256–79/AD 870–92)				
72	873–884	Afghanistan?	Mint?, *c* .2[60–70]. Thick flan, typical of the mints of Andaraba, Balkh and Banjhir (Afghanistan). 0.80 g, fragment.	Blindheim excav. 1963; fnr 963a.
73	873–884	Afghanistan?	Mint?, *[c.* 260–70]. Thick flan, as preceding coin. 0.74 g, fragment.	M-d survey, area 1B, modern plough soil, 2001; C52517/2607 (F55644).
Uncertain caliph? Illegible fragments				
74	833–892	Uncertain mint	Mint?, [219–79]. 0.70 g, fragment; heavily corroded, chipped and corroded edges.	Blindheim excav. 1964; fnr 1022c.

Cat. no.	Production date (AD)	Mint	Description	Find context and no.
75	833–892	Uncertain mint	Mint?, [219–79]. Rev: ring 2. 0.32 g, fragment.	M-d survey, area 1B, modern plough soil, 2000; C52517/79 (F990004).
76	833–892	Uncertain mint	Mint?, [219–79]. 0.28 g, fragment; corroded, broken edges.	Blindheim excav. 1964; fnr 1022d.
77	833–892	Uncertain mint	Mint?, [219–79]. 0.26 g, fragment; heavily corroded, with two small pieces detached, chipped edges.	Blindheim excav. 1964; fnr 1022b.
78	833–892	Uncertain mint	Mint?, [219–79]. 0.11 g, small fragment; broken edges.	Blindheim excav. 1963; fnr 963b.
SAMANID Isma`il bin Ahmad (H 279–95/AD 892–907) and Caliph al-Muktafi (H 289–95/AD 902–8)				
79	902–907	Balkh? (Afghanistan)	[Balkh?], [290–95?]. Rev: floral *ha'* of "Muhammad". *[Isma`il b Ahmad?].* 0.25 g, fragment.	M-d survey, area 1B, modern plough soil, 2002; C52517/1963 (F105364).
80	906/907	Andaraba or Balkh (Afghanistan)	[Andaraba or Balkh], [29]4. Obv below: *[...].* Rev: *[Isma`il b Ahmad].* 0.32 g, fragment.	M-d survey, area 1B, modern plough soil, 2000; C52517/121 (F990049).
Ahmad bin Isma`il (H 295–301/AD 907–14) and Caliph al-Muqtadir (H 295–320/AD 908–32)				
81	907–914	Samarkand? (Uzbekistan)	(Samarqand?), [295–301]. Rev: *(alMuqtadir billah) / Ahm(ad bin Isma`il).* 1.26 g, fragment.	M-d survey, area 2, modern plough soil, 2001; C52517/2135 (F55133).
Nuh bin Nasr (H 331–43/AD 943–54) and Caliph al-Mustakfi (H 333–34/AD 944–46, died 338, posthumously until H 346/AD 957)				
82	945/946	Tashkent (Uzbekistan)	al-Shash, [334]. Rev: *alMustakfi billah /Nuh bin Nasr.* 0.80 g, fragment; broken edges.	M-d survey, area 2, modern plough soil, 2001; C52517/2148 (F55146).
83	945–951	Samarkand (Uzbekistan)	[Samarqand], 33[4], 33[7] or 33[9]. Rev: *alMustakfi billah /Nuh bin Nasr.* 1.26 g, fragment.	M-d survey, area 3, modern plough soil, 2000; C52517/69 (F28735).
84	952–954	Tashkent (Uzbekistan)	[al-Shash], *[c.* 341–42]. Rev: *[alMustakfi billah] / [Nuh bin Na]sr.* 0.46 g, fragment.	M-d survey, area 2, modern plough soil, 2000; C52517/899 (F990884).
85	951–955	Andaraba (Afghanistan)	[Andaraba], 34[0–3]. Rev: *[alMustakfi billah] / Nuh [bin Nasr].* Date possibly '300', decade and unit being omitted due to lack of space. 0.58 g, fragment; both sides broken, part of one side folded back; graffito continuing under fold and off the broken edge See Blackburn, this vol. Ch. 3:67 and Fig. 3.24.	M-d survey, area 1B, modern plough soil, 2000; C52517/369 (F990317).

Cat. no.	Production date (AD)	Mint	Description	Find context and no.
IMITATIONS Volga Bulgars				
86	901/902	Volga Bulgaria (Russia)	Mint?, date? Obv: retrograde legends. Rev: *alMu`tadid billah /Isma`il b Ahmad.* Dateable to 289 (t.p.q. of the Klukowicz hoard, Poland). Rispling Chain 65, 23/R4 (new obv. die). 0.63 g, fragment; two scratches by cut edge, probably accidental; bent once.	M-d survey, area 2, modern plough soil, 2001; C52517/2539 (F55576).
Unknown origin (not Volga Bulgars)				
87	900–950?	Uncertain mint	Mint?, date? Obscure legends. Abbasid prototype from 9th century, but possibly struck later. Rispling: — (new dies). 1.24 g, fragment; bent twice and broken along one bend (part of breaking process?); one scratch at edge on each side, probably accidental.	M-d survey, area 2, modern plough soil, 2000; C52517/842 (F990825).
UNIDENTIFIED ISLAMIC DIRHAMS, UNCERTAIN DYNASTY				
88	698–955	Uncertain mint	Mint? date? (79–343). 0.97 g, large fragment; heavily corroded, chipped edges.	Blindheim excav. 1964; fnr 1022f.
89	698–955	Uncertain mint	Mint?, date? (79–343). 0.47 g, fragment; corroded, in three pieces.	Blindheim excav. 1964; fnr 1022h.
90	698–955	Uncertain mint	Mint?, date? (79–343). 0.41 g, fragment; corroded, broken edges.	Blindheim excav. 1966; fnr 1052a.
91	698–955	Uncertain mint	Mint?, date? (79–343). 0.29 g, fragment; folded over, heavily corroded and chipped.	CRM, later medieval plough-layer, 2000; C52516/4030 (F1004370).
92	698–955	Uncertain mint	Mint?, date? (79–343). 0.24 g, fragment; corroded, broken edges.	Blindheim excav. 1966; fnr 1052b.
93	698–955	Uncertain mint	Mint?, date? (79–343). 0.21 g, fragment; heavily corroded, chipped edges.	Blindheim excav. 1965; fnr 1031b.
94	698–955	Uncertain mint	Mint?, date? (79–343). 0.21 g, fragment; heavily corroded, chipped edges.	Blindheim excav. 1970; fnr 1115b.
95	698–955	Uncertain mint	Mint?, date? (79–343). 0.15 g, fragment; heavily corroded, chipped edges.	Blindheim excav. 1970; fnr 1115a.
96	698–955	Uncertain mint	Mint?, date? (79–343). 0.11 g, fragment; heavily corroded, chipped edges.	Blindheim excav. 1963; fnr 963c.
97	698–955	Uncertain mint	Mint?, date? (79–343). 0.11 g, fragment; heavily corroded, with two small pieces detached.	Blindheim excav. 1970; fnr 1115c.
98	698–955	Uncertain mint	Mint?, date? (79–343). 0.09 g, four tiny fragments; heavily corroded.	MRE, later medieval plough-layer, 2001; C52519/14348 (F1013225).

Cat. no.	Production date (AD)	Mint	Description	Find context and no.
99	698–955	Uncertain mint	Mint?, date? (79–343). 0.08 g, tiny fragment; corroded chip from a coin.	Blindheim excav. 1960s; without no. (b).
100	698–955	Uncertain mint	Mint?, date? (79–343). 0.07 g, tiny fragment; corroded and broken into four pieces. Skaare 1963:152–3, fig. 4.	Blindheim excav. 1960; without no. (a).
101	698–955	Uncertain mint	Mint?, date? (79–343). 0.03 g, tiny fragment; heavily corroded, in four pieces.	Blindheim excav. 1970; fnr 1115d.
HOARD/CRUCIBLE MELT				
102			A partially molten cake of silver from a crucible formed from at least 12 Islamic coins and at least two pieces of hack-silver. 29.81 g; max dimensions: width 28 mm, length 31 mm, height 15 mm. In areas that had been in contact with the curved surface of the crucible the silver has been thoroughly molten, leaving bubbles and blowholes. At the top and centre of the lump less fusion has occurred and elements of the original objects can be seen. The hack-silver includes a plain cylindrical rod 3.4 mm in diam. and 14.7 mm long (wt. *c.* 1.5 g), and a piece of rod of rectangular section 6.7 x 5.0 mm and 14.1 mm long (wt. *c.* 5 g). Both of these have an end that was clearly cut rather than broken. The remains of some 12 coin fragments are visible, but only two of these are identifiable, as follows:	M-d survey, area 1B, modern plough soil, 2002; C52517/1737 (F105110). See Blackburn, this vol. Ch. 3:Fig. 3.1.
Abbasid, al-Mahdi (H 158–169/AD 775–785)				
A	782/783	Kairouan (Tunisia)	(al-`Abbasiyya), (*c.* 166). Only rev. visible. Rev: *bakh/M/R/A/(Yazid).*	
Abbasid, Uncertain caliph				
B	750–816	Uncertain mint	Mint?, [132–200]. Only obv. visible.	
C-L			At least ten further coin fragments, unidentified.	
			This lump should be treated as a hoard, rather than single-finds, as the items were gathered together on one occasion, albeit probably for silver working or casting into an ingot, rather than as a deposit intended to be preserved intact. The *terminus post quem* of the two identifiable coins is 782, but in the context of the Kaupang site the group is likely to be from the second half of the 9th or early 10th century. See discussion in Blackburn, this vol. Ch. 3:32–4.	

4.2 Coin finds from the Huseby site

Cat. no.	Production date (AD)	Mint	Description	Find context and no.
VIKING-AGE Anglo-Saxon Harthacnut (2nd reign, 1040–42)				
Hu1	1040–42	Oxford? (England)	Silver penny, Arm-and-Sceptre type. Uncertain mint (Oxford?), moneyer Ælwig *(Æthelwig)*. Obv. +H[ARÐA]CNVT RE, bust left with sceptre; rev. +ÆLPIG ON [ ]:, voided cross with central lozenge, within inner circle (Hildebrand 1881:type B); a moneyer Æthelwig is recorded from coins of this type at Oxford, Wallingford and Winchester, and this specimen is possibly from the same rev. die as *SCBI* 40, 1695 (Oxford). 0.47 g, fragment; about half a coin, broken edge, corroded and further broken in two pieces.	Excavations at Huseby, unstratified over building platform, 2001; C52518/920.
German Lower Lotharingia: Archbishops of Cologne Archbishop Sigwin (1079–89)				
Hu2	1079–89	Cologne/Köln (Germany)	Silver denar (Hävernick 1935:no. 392). Obv. [+SIGV]VIN [ARCHEPIS], profile bust left with three large crosses on mantle, holding crosier; rev. +AIN[CTA COLONAIS], walled building with three towers. 0.52 g, fragment of cut halfpenny; long side cut, short side broken.	Excavations at Huseby, unstratified over building platform, 2001; C52518/258.
LATER MEDIEVAL Danish Kristian I (1448–81)				
Hu3	1448–81	Malmö (Sweden)	Base silver hvid (Galster 1972:no. 23c). 0.39 g, whole coin.	Excavations at Huseby, unstratified over building platform, 2001; C52518/390.
German Lübeck City				
Hu4	1559	Lübeck (Germany)	Base silver Sechsling, 1559 (Schulten 1974:no. 1842). 0.37 g, fragment; whole, but broken into three pieces.	Excavations at Huseby, unstratified over building platform, 2001; C52518/2.

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Cat. no. 100

Cat. no. 101

Cat. no. 102

Cat. no. Hu1

Cat. no. Hu2

Cat. no. Hu3

Cat. no. Hu4

Hacksilver and Ingots

5

BIRGITTA HÅRDH

The use of silver as a means of payment in the early Viking Age is discussed here with particular reference to the newly retrieved material from Kaupang. 115 pieces of hacksilver are examined statistically according to weight, and the results are discussed in connection with Viking-age silver hoards from Norway, Southern Scandinavia and North-Western Europe. The evidence is also compared with that from the central place at Uppåkra in Skåne.

The degree of fragmentation is very high, the majority of the fragments weighing between one and two grammes at most. In this respect the hacksilver from Kaupang matches the typical hacksilver hoards of Scandinavia and the Baltic region. This probably indicates that silver was used intensely as a means of payment or currency, and that even commodities of everyday character could be paid for with silver.

Special attention is paid to cast ingots and fragments of rings. One ingot with a weight of 48.3 g is of special interest as it belongs to a group of early Viking-age weight-adjusted ingots that are concentrated in South-Western Scandinavia, Schleswig-Holstein, The Netherlands and Gotland. It is clear that these ingots were cast to correspond to a fixed unit of value. It is possible to connect them with the Scandinavian "mark", of which a weight-unit around 50 g is a fraction. However, it is also possible that weight-units from Russia, possibly the Perm region, could have been the basis.

Amongst the pieces of hacksilver there are several fragments of spiral-striated and stamped rings of a type common in what is now Denmark. These rings are weight-adjusted in the same way as the ingots, belong to the earliest part of the Viking Age, and are also to be regarded as some kind of money in large units. Some fragments of ribbon-shaped armrings, often stamped, show a connection with Denmark, Western Europe, Britain and Ireland.

Of particular importance is the early date of the Kaupang fragments: several of them belong to the 9th century. The evidence of the coins corroborates the picture presented by the non-minted silver. A few pieces of hacksilver from dated contexts reinforce the evidence for the use of silver as a means of payment from the mid-9th century at the latest. The new evidence from Kaupang, together with that from Birka and Uppåkra, is extremely important in supplementing the situation suggested by the silver hoards.

5.1 Introduction

I shall present the non-minted hacksilver from Kaupang principally with the aim of discussing its possible significance in the economy of the town. The material consists of pieces of silver retrieved from the settlement site at Kaupang. In several cases it can be shown that silver objects have been deliberately cut, probably to be used as currency in a weight-based system. There is further a group of fragments without clear cut marks. These are more difficult to assess and may derive from objects that were accidentally broken, although they may, of course, still have been used for payment. A leading concern of this study is to discuss how the fragmentation may be understood. The character of the material will be described, and as far as possible I shall try to see whether the fragments derive from objects that can be identified or if they are pieces of non-specific sheet metal, rods etc. An important question will be whether it is possible to determine the origin of some pieces. Also important for this study is the condition of the fragments: is it possible not only to ascertain if they were cut or broken, but also if there are pecks, graffiti, and the like?

Several of the fragments derive from ingots. The silver from the settlement site of Kaupang included five complete ingots. These will also be considered here, as ingots are frequently a feature of silver hoards of the Viking Age and were sometimes produced according to a fixed weight-system. They could thus likewise have served as a means of payment.

Silver of the same character as that from Kaupang has been retrieved from a number of settlement sites in South-Western Scandinavia, including Tissø and Strøby on Sjælland and Uppåkra in Skåne. Uppåkra is the largest rural Iron-age settlement in Southern Scandinavia, and seems to have functioned as a central place throughout the first millennium AD. The Viking-age record from Uppåkra is substantial, showing that the place then was a multifunctional site with craft, trade, external contacts and elements of aristocratic character. Not least, the silver finds are abundant (Larsson and Hårdh 1998; Hårdh 2000; Larsson 2002). I shall compare the hacksilver from Kaupang with the material from Uppåkra as there is a clear correspondence between them. I have also analysed both groups myself. Other settlement finds, mainly from Southern Scandinavia, will be considered as far as is practical. I shall also make comparisons with hacksilver from silver hoards in Southern Norway and other areas. These comparisons should contribute to a better understanding of the silver finds from the Kaupang settlement site.

A fundamental evaluation of the evidence is appropriate here. The silver objects from Kaupang have been retrieved mainly through metal detecting. The Uppåkra material has been found using the same methods and by the same detector specialists. In this respect the two collections are comparable. However, the soil conditions differ between the two sites. Metal objects are generally better preserved at Uppåkra than at Kaupang. This can of course bias weight analysis, especially as the fragments are usually very small. As for comparisons with fragments from silver hoards, a serious problem is whether the hoard has been recovered in its entirety. The reason for presenting the range of weights amongst the fragments here is to give a general picture of the degree of fragmentation as a point of departure for discussing the use of the silver.

5.2 The Kaupang silver finds of 1998–2002

From the new work at Kaupang 238 silver objects have been recorded. Amongst these a number of categories have been identified (Tab. 5.1). The largest group, 87 pieces, consists of cut pieces of wire, sheet metal and ingots. It is frequently also possible to identify fragmented pieces of jewellery amongst these, mainly armrings. This group is here referred to as hacksilver/currency or "betalingssølv". Another group consists of fragments, indeterminable objects, some of them utterly corroded. These two categories will be treated in this article together with the ingots.

Hacksilver/currency	87
Ingots	5
Fragments	43
Other	6
Mounts, Continental origin	1
Coins	70
Production waste	26
Total	**238**

Table 5.1 *Silver objects from the excavations of 1998–2002. Not included are a few objects with silver mounted on copper or iron or objects with a high copper content.*

In a coming volume in this series the mounts of Continental origin will, together with other Continental items, be discussed by Egon Wamers (in prep.). Complete pieces of jewellery of Scandinavian origin will be discussed by Hårdh, together with other Scandinavian pieces of jewellery of copper alloy (Hårdh, in prep.b). The coins, 70 finds, will be discussed separately by Mark Blackburn and by Christoph Kilger in this volume (Chs. 3 and 7) but the results of their studies are considered here together with the non-minted silver. Silver objects, melts and lumps, that clearly derive from the production process, 26 pieces, will not be considered here as they will be treated by Unn Pedersen (in prep.). That leaves a total of 135 objects to be considered here (Tab. 5.1).

Of the pieces labelled as hacksilver or currency, three are known from Cultural Resource Management (CRM) excavations, 55 derive from metal detector surveys of the plough-soil and 29 from the main research excavation 2000–2002. (For an overview of the various excavations, see Pilø and Skre, this vol. Ch. 2:Fig. 2.4.)

The important question is of course how the silver fragments at Kaupang and other Viking-age sites should be understood. The similarity to the objects in the silver hoards, as well as the abundant occurrence of coins from the same sites, might indicate that the silver was used to a large extent as currency. Weights and fragments of balances are also numerous in seasonal market places and urban sites of the Viking Age and have been associated with hacksilver. The silver fragments might of course also be remnants from handicraft in precious metals.

The waste products, mentioned above, are an indication that silver was worked at the site. Drops of gold show that gold was also worked here. Other traces of metal handicraft in Kaupang include the unique collection of lead models, which will be discussed by Unn Pedersen. The distribution of the hacksilver at the site corresponds closely with the distribution of waste from the production process, which is a problem for the interpretation of cut pieces and fragments, as these may equally well derive from metalworking. (On the distribution of silver and related items: Pedersen, this vol. Ch. 6:Fig. 6.30.)

5.3 Silver finds from Charlotte Blindheim's excavations 1950–1974

The silver finds from the earlier excavations at the settlement site under Charlotte Blindheim total 60 pieces with a total weight of 115 g (Tab. 5.2). They are fragments, in several cases intentionally cut, and melt lumps (unpub. reps., KHM). Amongst the cut fragments there are pieces of stamp-decorated armrings, pins or fragments of pins which could have belonged to ring-pins, and a couple of spiral-striated rods, probably from rings of the so-called Permian type or something closely related (further, below). 29 coins are reported to have been found (Skaare 1976; Blindheim et al. 1999:119). An ingot mentioned by Blindheim (1969:20) is not included in the documented material and is probably lost. In types of objects and the way they have been treated while in use, the silver finds from this settlement excavation correspond closely with the material retrieved during the field surveys and excavations of 1998–2002.

Fragments of stamp-decorated armrings	3
Pin/pin-fragments	5
Piece of hacksilver (included two spiral-striated rods)	22
Melts and lumps	9
Missing	6
Unidentifiable	15
Total	**60**

Table 5.2 *Material from the Blindheim settlement excavation, compiled by Heyerdahl-Larsen. Unpublished reports in KHM.*

The methods of investigation in the two campaigns were different, however. The majority of the silver from 1998–2002 was found using metal detectors. Besides, all intact deposits and a high proportion of the disturbed deposits were water sieved and it is obvious that the pieces retrieved in these ways are smaller on average than those from the earlier investigations. This is the reason why the silver from the old excavations has not been included in the tables and diagrams in this article.

Some coins and hacksilver have been retrieved from the graves at Bikjholberget. Three graves contained coins and another two graves had traces of metal that might be remnants of coins. Interestingly, a richly equipped male grave from the 9th century contained some hacksilver (Blindheim et al. 1999: 119).

5.4 Silver as currency

The economy of the Viking Age in Northern Europe can be divided into two major blocs where the means of payment were based respectively on coins and on weights of precious metal, i.e. silver. On the Continent, the borderline between the two systems ran along the eastern border of the Carolingian-Ottonian realm at the Elbe. West of this border the economy of the 8th–10th century was mainly monetized, whereas east of it we find the typical hacksilver hoards with a mixture of coins of varied origin together with pieces of jewellery, ingots, rods etc., all cut into small fragments, indicating that the silver was valued according to weight. It is also worth noticing that the distribution of Islamic coins in Northern Europe corresponds sharply with this economic division. Very few dirhams have been found west of the border (Steuer et al. 2002:135 with refs.). In 9th-century Scandinavia coins seem to have been struck only in the far southwest, the Jutish peninsula with the centres of Hedeby and Ribe.

The use of silver as currency in Viking-age Scandinavia is of course connected to the massive inflow of silver and also to the contacts with developed, monetized economies in east and west. The abundance of silver, usually as collections of hoarded hacksilver, is a strong indication that parts of the North European Viking-age economy used currency in the form of fragmented silver.

We must assume that knowledge of coins and their use were well established amongst those Scandinavians who travelled and traded. However, Scandinavian Viking-age society was not at a sufficient level of organization for a monetized system to function. Balances and weights are occasionally known in Scandinavia from as early as the Roman and Migration Periods. From the Early Viking Age there is much evidence of standardized weights and balances so that, together with the inflow of Islamic silver at the same time, the prerequisites for a weight-based economy were in place. According to Steuer the "Gewichtsgeldwirtschaft", based on Islamic influences, spread almost instantaneously from the interior of Russia to the Jutlandic peninsula at the end of the 9th century (Steuer et al. 2002:137 with refs.).

There are several indications that other commodities or raw materials were also used as currency, such as iron bars, textiles or furs (Herrmann 1982: 105). Silver, however, had many advantages. It could only be obtained with certain efforts and is almost indestructible, and so can be hoarded in the ground. Most importantly, it could of course be cut into smaller units, while fragments could also be melted and combined into bigger units.

The result of such handling of the silver is, in my view, the phenomenon called hacksilver. By this term is meant silver objects, coins, pieces of jewellery, ingots etc. that have deliberately been cut into pieces.

Typical of hacksilver hoards is that any single object, ornament or coin is represented by only a single fragment, from which it can be inferred that the rest of the object has been dispersed. This is the main reason for regarding the hacksilver hoards as currency hoards.

The hacksilver hoards are, as noted, composed of coins of varying origins and other objects such as jewellery, rods and ingots. Where it can be determined, the non-minted objects in the silver hoards prove to be mainly of local origin. This is good evidence that Viking-age silver hoards were normally collected within the regions in which they are found. This is also why the non-minted material is better than the coins as a point of departure for a regional analysis of how silver was treated, fragmented, pecked etc., and for showing how it was used. Coins had often travelled long distances and we can seldom determine where they were fragmented or otherwise transformed. Thus, for example, Brather (1997:83 with refs.) points out that after c. 830 silver coins could be cut up even in the Islamic world, so that they could have arrived in Northern Europe already fragmented.

The silver hoards of Northern Europe are not a homogeneous group in any way. They vary regionally and chronologically according to frequency, composition, weight, and degree of fragmentation. Some hoards are dominated by complete items of jewellery. They can therefore not be collections of currency but must be regarded as caches of treasures, family fortunes, gifts used in social strategies, or offerings. The appearance of the hoards indicates that silver, and gold too, served a multiplicity of purposes which also varied regionally (Hårdh 1996).

Silver was abundant in Scandinavia from as early as the 9th century. Brather records a number of silver hoards containing Islamic dirhams with a t.p.q. before 900. These hoards are predominantly found in eastern mainland Sweden and on the Baltic islands. It is also in these regions that the largest dirham hoards have been found. Only in these parts of Scandinavia and the Baltic region are hoards with more than a thousand coins known. The islands of Åland and Rügen also have a large share of early dirhams. However, a number of early dirham hoards are known from the Southern Baltic coastal regions, between the Odra estuary and Southern Denmark. These hoards contain fewer coins but there is also an element of jewellery in them. In South-Western Scandinavia there are three hoards which are important to consider together with the Kaupang evidence because all three belong to the 9th century and contain early Islamic coins. These are the Southern Norwegian hoards from Hoen, Buskerud, and Os in Halden, together with that from Önum, Kettilstorp, Västergötland (Brather 1997:abb. 4 and 6; Fuglsang and Wilson 2006; for further discussion of 9th century hoards see Kilger, this vol. Ch. 7:214–35).

Some early dirham hoards contain coin fragments, occasionally in great quantity, that could be an indication of silver having been weighed and fragmented in the course of transactions. Thus the two recently found Gotlandic hoards from Spillings, Othem, with t.p.q.'s of 867 and 871 respectively, contained 5,100 and 9,200 coins that are fragmented to a degree of about 90% (Rispling 2004c; Welin 1938: 124). Typical of these hoards is that they consist of highly fragmented coins together with complete heavy items of jewellery, often weighing c. 50–200 g, and large fragments of rings, rods etc., usually weighing tens of grammes.

Two important silver hoards have recently been found at Westerklief, Wieringen, in Frisia. The first hoard found, Westerklief I, contained a mixture of Islamic and Carolingian coins together with ingots and jewellery, complete and fragmented, of Scandinavian types. This hoard was probably buried around 850. The second hoard, Westerklief II, had a different character, as the presence of hacksilver was much more pronounced. Out of 95 Islamic coins 53 had deliberately been fragmented. This hoard had a t.p.q. of 877. The mixture of Islamic and Carolingian coins of almost the same date shows, according to Besteman, that Islamic coins were circulating in Scandinavia in the 870s. Besteman maintains that the difference between the two hoards shows how during the short chronological interval between them silver had moved from a primarily social to a more pronounced economic role. He regards the two finds as Scandinavian, implying that this change in attitude towards silver was developing during the third quarter of the 9th century in Scandinavia (Besteman 2002:448–50).

That hacksilver was a well-known phenomenon in England and Ireland in the 9th and early 10th centuries is confirmed by a number of hoards that have much in common with contemporary Scandinavian hoards both in composition and in content. The large Cuerdale hoard from Lancashire comprises about 7,000 coins of Anglo-Saxon, Continental and Islamic issue. The non-minted objects are ingots and jewellery, complete and cut. The pieces of jewellery also show a mixed origin, Anglo-Saxon, Scandinavian, Pictish, Carolingian and Hiberno-Norse (Graham Campbell 1992a:10–11). The Cuerdale hoard was deposited early in the 10th century, c. 905. The hoard from Croydon, Surrey, with coins of mixed origin, amongst them three Islamic ones, together with hacksilver, is of even earlier date, c. 872 (Brooks and Graham-Campbell 2000:69–70). This hoard too has hacksilver with parallels in Scandinavian contexts (further below). A number of Irish hoards deposited during the first decades of the 10th century show the same mixture of coins with ingots, pieces of jewellery and hacksilver (Sheehan 1998:169).

In Scandinavia, first and foremost in its southern and western areas, 9th-century finds of precious metals often show a close connection to Continental Europe, mainly with the Carolingian realm. The magnificent gold hoard from Hoen mentioned above contains pieces of jewellery of varied origin, including several Carolingian items. The hoard from Heljarp, Tofta in Skåne and the recently discovered Duesminde II hoard from Lolland, Denmark, consist of objects from Carolingian workshops (Hårdh 1976:70; Schilling 2003; Schilling and Wamers 2005). The Heljarp and Duesminde II hoards were probably collected in Western Europe and brought to Scandinavia as collections of valuables, either plundered or as exquisite gifts. This type of hoard cannot be used as evidence of the use of gold or silver as currency in 9th-century Scandinavia.

According to my definition, a typical hacksilver hoard consists of coins, coin-fragments and non-minted objects. Of the latter at least 50% should be fragmented and at least 50% should weigh less than 5 g (Hårdh 1996:93). This type of hoard is best explained as a collection of currency. The extremely small fragments are evidence that silver was used intensely and even on an everyday level to pay for inexpensive items (Hårdh 1996:84 with refs.). These hoards generally consist only of silver objects, while gold, copper-alloy jewellery, and beads of glass, cornelian etc., which are typical of other types of hoard, do not occur. Also typical is that more than one fragment of any single artefact is rarely found. The mixture, seen above all in the diverse origins of the coins, together with the degree of fragmentation, shows that the silver has circulated and changed hands several times. The hacksilver itself changes in a regular way both chronologically and geographically, first and foremost in the degree of fragmentation. For instance the hacksilver hoards as defined above appear earliest in present-day Denmark. The phenomenon of hacksilver, then, gradually spread to the north and east, so that hacksilver hoards as a phenomenon appear later in the rest of Scandinavia. In some regions, such as Western Norway, there are hardly any hacksilver hoards at all. The chronological and regional variation indicates that the hoards reflect the composition of currency in different parts of Scandinavia and the Baltic region, and also that they may show how the development of means of payment proceeded in different regions (Hårdh 1976, 1996).

In Scandinavia, hacksilver hoards are primarily a phenomenon of the 10th century and the first decades of the 11th. The earliest hacksilver hoards in Scandinavia, dated to the beginning of the 10th century, are concentrated in South-Western and Western Jutland, South-Western and Western Sweden, and in the Oslofjord region. This was probably the earliest area in Scandinavia to develop the regular use of silver as a means of payment. The highly fragmented silver in the hacksilver hoards indicates that there was a need for small units of silver, and hacksilver is thus thought to be a stage anticipating the introduction of a monetized economy. The intense economic development of this period, starting in the southern part of the Jutlandic peninsula, was stimulated by the advanced economy of the Carolingian Empire (Hårdh 1996:168; for a different view see Kilger, this vol. Ch. 7:211–14). Hacksilver is especially abundant in Skåne and in the West Slavic regions. The fragmentation of silver seems to reach a peak here in the late 10th century and around the year 1000. Interestingly, hacksilver hoards seem to decrease in Jutland in the later part of the 10th century, just when the phenomenon was at its height further east. This may be because Hedeby and adjacent regions had already adopted a monetary economy in the 10th century, with hacksilver going out of use. This coincides with the most intense period of production of the so-called Hedeby bracteates around 975/980 (Malmer 1966:247, 1990:160; Hårdh 1996:128–9; Wiechmann 1996:191).

The recent excavations at Birka, Uppåkra and Kaupang have revealed a new aspect of the use of silver as currency in the Viking Age. At all three places fragments of silver coins and other objects have been found in the stratified deposits or in the ploughlayer. What is important is that coins and coin-fragments occur together with substantial quantities of small pieces of non-minted silver of the same character as those from the typical hacksilver hoards. The scattered distribution at all the three sites means that it is probable that the silver was lost bit by bit, just as we might imagine of currency handled during trade. All three sites are similar in respect of the chronology and provenance of coins (Blackburn, this vol. Ch. 3:48–51) and the types of non-minted objects. It is of great importance that the hacksilver from the three sites, according to the dating of the coins, indicates an earlier use of silver as currency than the evidence of the silver hoards does. Thus the silver from the Kaupang excavations, together with the finds from Birka and Uppåkra, gives us a new and important insight into economic practices in the earliest part of the Viking Age (for Birka see Gustin 1998, 2004a; Rispling 2004a; see also Kilger, this vol. Ch. 8 and Skre, this vol. Ch. 10).

5.5 The hacksilver

This analysis concerns 115 pieces of silver. There is a distinction between hacksilver/currency and fragments. The first group consists of pieces that have definitely been cut. The fragments, on the other hand, are small pieces, often extensively corroded, and simply difficult to determine in this respect.

87 silver objects have, as mentioned above, been labelled as hacksilver or currency. Of the 43 silver objects from the investigations of 1998–2002 that are classified as "fragments", many are very small and

heavily corroded. Several of them were discarded after x-radiography as the silver was totally dissolved. The remaining fragments, 28 pieces, should possibly also be considered with the hacksilver group. However, this group of fragments is of course even more difficult to assess than the group which has been labelled hacksilver. I shall therefore give both tables and diagrams that include the "fragment" group, and tables and diagrams without it.

Special attention will be paid to the five complete ingots and the ten spiral-striated rods, which probably derive from weight-adjusted rings, and are thus some kind of value unit. These objects will be considered separately, with a special discussion of weights.

5.5.1 Analysis of the hacksilver by weight

If a high proportion of the hacksilver from the Kaupang settlement is to be understood as lost currency we could expect a certain correspondence in weights with geographically and chronologically related silver hoards. Naturally there are several potential sources of error in such an analysis. The hoards are closed finds, concealed at a specific moment, but may also be an accumulated collection to which the owner has successively added more silver.

The silver deriving from settlement deposits may be objects successively lost by many owners over a period of time. In this respect it is comparable with coins found on such sites. The silver in the hacksilver hoards shows such regularity in chronological and geographical variation that the only reasonable explanation can be that these hoards give a fairly representative image of the system of payment at these periods in these areas (Hårdh 1996). Numismatists often refer to "Gresham's Law", which is, if someone possesses two coins, one with a high standard of fineness and the other with a lower one, the high-quality coin will be hoarded while the lower one will be used for payment (Herschend 1989). In the same way it is possible that more varied and perhaps older fragments were used in everyday exchange in preference to cutting up more complete coins, which should preferably be kept for the future and hoarded. This means that the silver hoards might after all consist of a particular selection of exchangeable valuables. Coins from settlements, which are regarded as lost, would consequently give a more realistic picture of the circulating coin stock. This might also hold true for non-minted silver to a certain extent, especially for the small fragments which could easily be lost. Larger pieces of silver, complete rings and the like, were certainly not lost, and would not in any case have been left lying on the ground (e.g. Christophersen 1989b:3; Carelli 2001:191–4). These sorts of comparison between silver collected from various urban and rural settlements and silver from silver hoards thus cannot be used to prove anything, but rather provide a point of departure for discussing the function of the silver.

The silver hoards are principally to be regarded as collections of currency whereas the silver from the plough-layers and stratified deposits at Kaupang and Uppåkra probably derives from multiple activities. The record from Uppåkra is even harder to interpret than that from Kaupang. The main reason for this is that the central place of Uppåkra was in continuous use for an extremely long time, with central-place functions for about a thousand years. Some of the sil-

Kaupang grammes	%	Number
0–0.9	25.3	22
1.0–1.9	27.6	24
2–2.9	6.9	6
3–3.9	11.5	10
4–4.9	10.4	9
5–5.9	1.1	1
6–6.9	3.5	3
7–7.9	3.5	3
8–8.9	2.3	2
9–9.9	3.5	3
10–10.9	1.1	1
11–11.9	1.1	1
12–12.9		
13–13.9		
14–14.9	1.1	1
15–15.9	1.1	1
Total	**100**	**87**

Table 5.3 *Weight-distribution of the hacksilver from Kaupang. Numbers and percentages.*

Figure 5.1 *A selection of hacksilver from Kaupang. Photo, Eirik Irgens Johnsen, KHM.*

Uppåkra grammes	%	Number
–0.9	28.4	38
1.0–1.9	24.6	33
2–2.9	18.7	25
3–3.9	9.7	13
4–4.9	9	12
5–5.9	2.2	3
6–6.9	1.5	2
7–7.9	3	4
8–8.9		
9–9.9	0.7	1
10–10.9		
11–11.9		
12–12.9	0.7	1
13–13.9		
14–14.9		
15–15.9		
16–16.9		
17–17.9		
18–18.9	0.7	1
19–19.9	0.7	1
Total	**100**	**134**

Table 5.4 *Weight-distribution of the hacksilver from Uppåkra. Percentages.*

ver will not necessarily be of the Viking Age. The results of the weight analysis must therefore be treated with caution but may, however, be useful for discussing the use of silver at Kaupang.

Tables 5.3–4 and diagrams Figures 5.2–3 from the two sites show a clear predominance of light pieces of hacksilver. At Uppåkra pieces with weights below one gramme are predominant and pieces weighing between one and two grammes are the next largest group. This is closely in accordance with the distribution of weights of non-minted hacksilver in hoards from the Skåne/Bornholm region dated to the 10th or early 11th centuries (Hårdh 1996:diagrams 19–21, tabs. 30–1).

The hacksilver from Kaupang is also dominated by small and light pieces of hacksilver. In this case, however, pieces between one and two grammes form the largest group, followed by pieces with weights below one gramme as the next largest group. The difference between the groups is small, however.

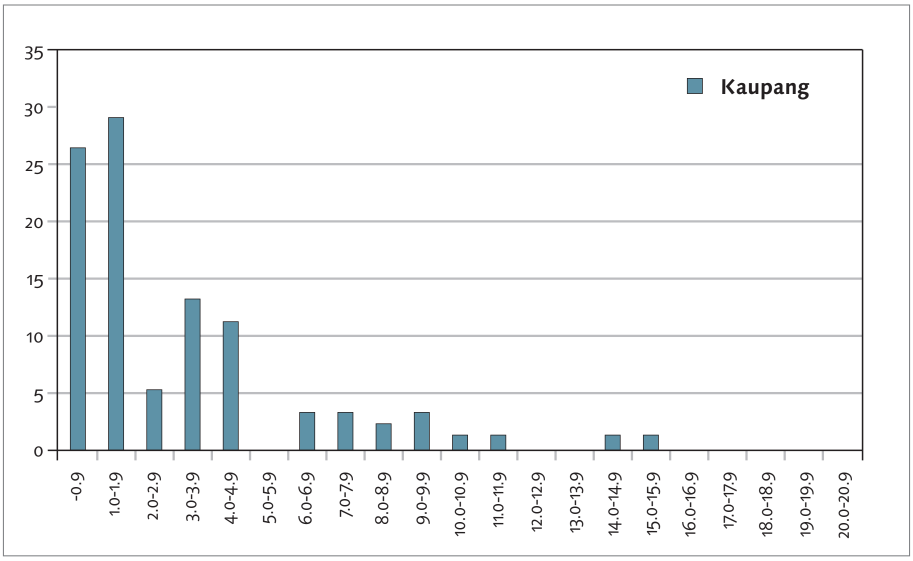
It could be expected that the hacksilver from Kaupang should follow the pattern of early hacksilver hoards from Western Sweden and the Oslofjord area. A couple of caches of coins and hacksilver, at Teisen, Ø. Aker, Akershus (t.p.q. 932, C1137–43) and Kinne, Kleva, Västergötland (t.p.q. 954, SHM 4232), both from the first half or middle of the 10th century, show a distribution of weights which corresponds well with hoards from present day Denmark of the same period, and with the weight-distribution of the hacksilver from the plough-layers at Uppåkra. Other finds, such as Grimestad, Stokke, Vestfold (t.p.q. 921, C26387), show a quite different distribution of weights with a predominance of larger, heavier fragments of 20–40 g. The Grimestad hoard matches some Western Swedish hoards from the first half and the middle of the 10th century, where heavier fragments are also predominant (Hårdh 1996:diagrams 10–11, tabs. 22–3). These hoards may show a stage at which silver was used as a currency, albeit not yet as intensely as in Denmark at that time. Hoards like Teisen and Kleva may, however, indicate that their owners were in close contact with Denmark or took part in transactions typical of that region.

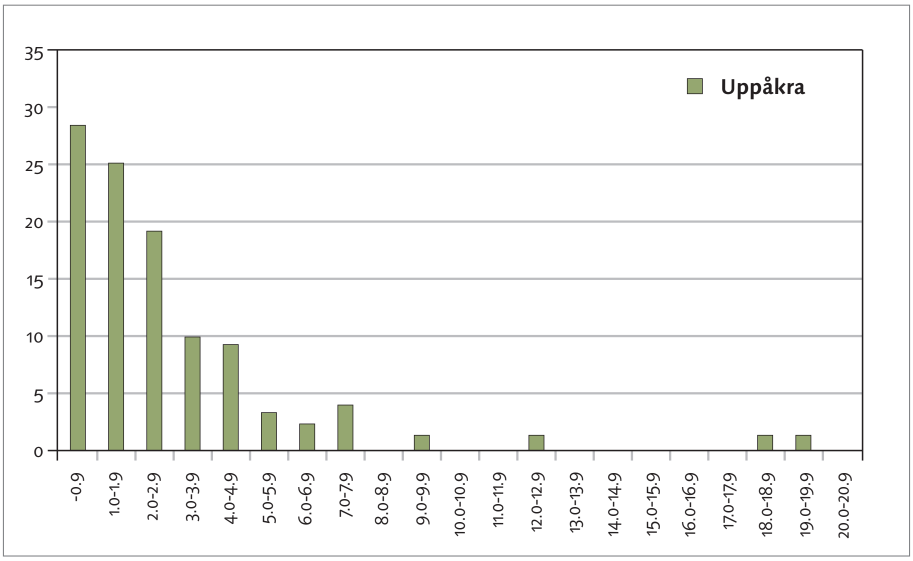
The weight-difference between Kaupang and Uppåkra may have several explanations. The chronological concentration may be different, as Uppåkra also has several coins from the second half of the 10th century and beginning of the 11th, a group which is missing in Kaupang. The decades around the year 1000 are the period when fragmentation was at its most intense in Southern Scandinavia and in the

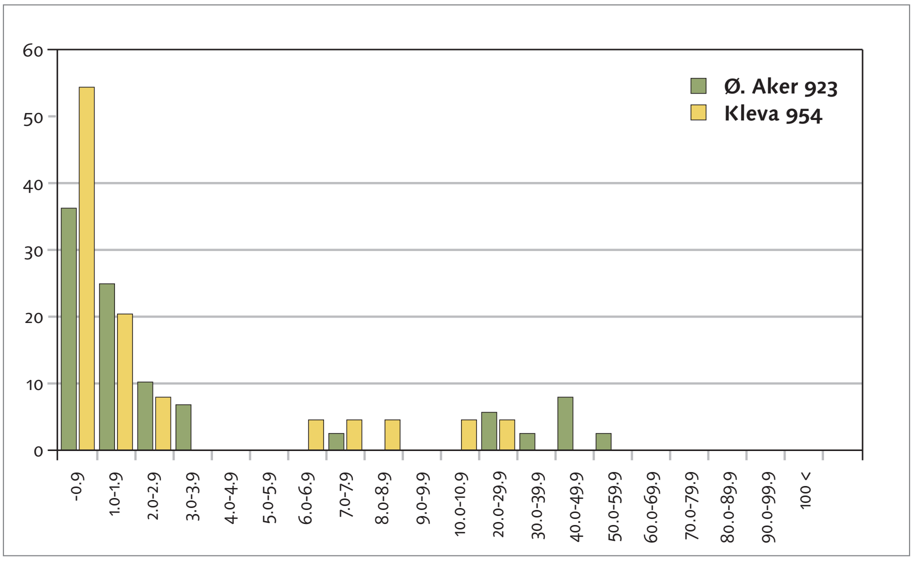
Figure 5.2 *Diagram showing the distribution of weights by percentage at Kaupang.*

Figure 5.3 *Diagram showing the distribution of weights by percentage at Uppåkra.*

Figure 5.4 *Diagrams showing the distribution of weights in percentages from two early Viking-age hoards from Western Sweden and the Oslofjord area. Based on Hårdh 1996:diagram 11.*







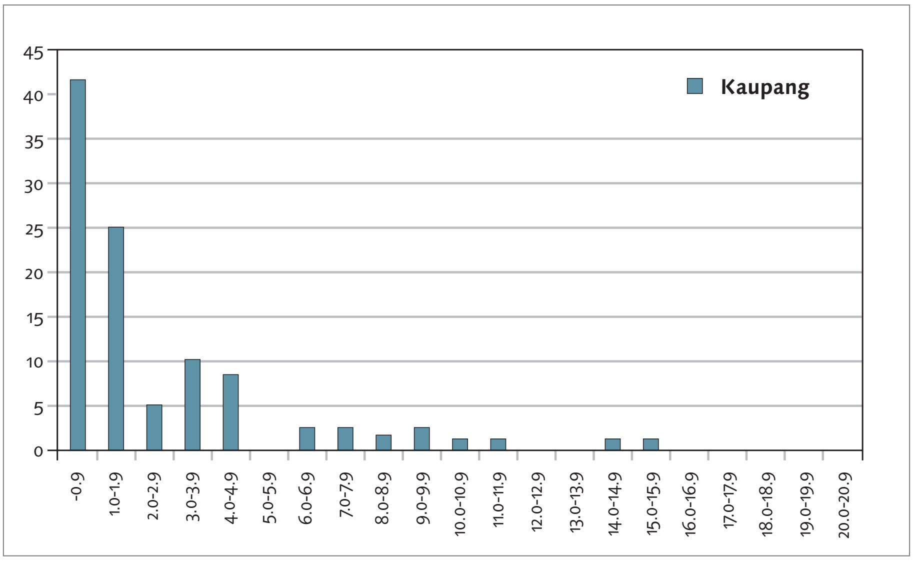


Figure 5.5 *Diagram showing the distribution of weights in percentages of hacksilver including the "fragments" from Kaupang.*

West Slavic area, including Skåne (Hårdh 1996:125). From the Kaupang excavations of 1998–2002 there are, as mentioned, a number of objects classified as "fragments", 28 of which might be regarded as hacksilver. These are very light in weight, mainly under one gramme. If these are included in diagrams and tables the distribution of weight-groups from Kaupang has a predominance in the lightest group (Tab. 5.5, Fig. 5.5).

Kaupang hacksilver + fragments

Grammes	%	Number
–0.9	39.1	45
1.0–1.9	25.2	29
2–2.9	5.2	6
3–3.9	8.7	10
4–4.9	7.8	9
5–5.9	0.9	1
6–6.9	2.6	3
7–7.9	2.6	3
8–8.9	1.7	2
9–9.9	2.6	3
10–10.9	0.9	1
11–11.9	0.9	1
12–12.9		
13–13.9		
14–14.9	0.9	1
15–15.9	0.9	1
Total	**100**	**115**

Table 5.5 *Weight-distribution of hacksilver from Kaupang including the 28 "fragments". Percentages.*

In this regard, the large amount of usually cut Islamic coins with a strikingly early dating is of the greatest interest. In the case of the coins, too, there is a clear correspondence between Kaupang and Uppåkra, first and foremost in the strong presence of Abbasid dirhams but also in the pronounced fragmentation of the coins at both sites (see further, Blackburn this vol. Ch. 3:48–51).

Islamic coins from Kaupang are usually highly fragmented with an absolute predominance of fragments below one gramme. If the coins from both sites constituted currency in a weight economy, and were used during the 9th century, it is reasonable to consider the non-minted fragments alongside the coins and to regard them, too, as currency. It has been emphasized that the hacksilver material from both Kaupang and Uppåkra contains several potentially misleading factors. What can be stated, however, is that the degree of fragmentation is closely congruent at both places, as with the evidence from hacksilver hoards, while it also shows similarities with coins found at both places. Even if it cannot be proven that all the small fragments are equivalent to the hacksilver from hacksilver hoards, I think it is reasonable to suggest that this was basically the case. If the small fragments served a weight-based economy, this also implies that weighed silver was used in exchange for commodities of an everyday character.

5.6 Ingots

The Kaupang silver includes five complete ingots, C52517/579, C52517/584, C52517/2043, C52519/10375 and C52517/334. They are all oblong with rounded ends and almost rectangular in cross-section. They vary considerably in size and weight, from 1.50 to 48.28 g. One of the smaller ingots has some traces of hammering but the rest are unworked. Beside the complete ingots there are also twelve ingot-fragments which have been cut at one or both ends. They show

Figure 5.6 *Ingot C52517/579, weight 48.277 g. Photo, Eirik Irgens Johnsen, KHM.*

Figure 5.7 *The hoard from Grimestad, Vestfold. Photo, KHM.*

great variation in cross-section. Circular, oval, trapezoidal, 4-sided and 6-sided cross-sections have been noted, although a rectangular shape is predominant.

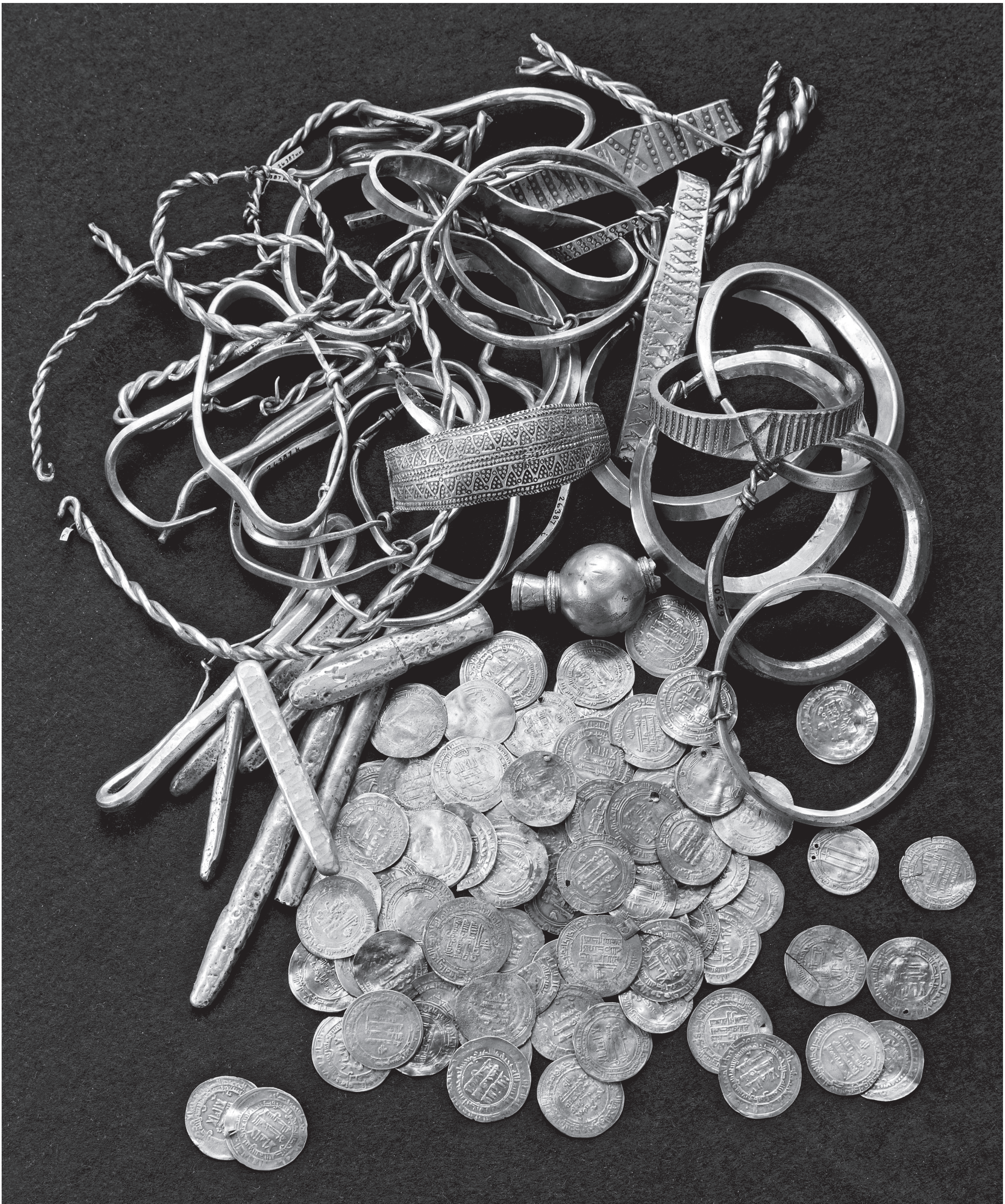
A high proportion of the silver hoards from Scandinavia and the Baltic region contain ingots of silver. These are oblong pieces with rounded ends, usually unworked after casting and often of D-shaped cross-section. They have been cast in open moulds, often of soapstone. More than 200 soapstone moulds for such ingots are known from Hedeby. Most of the moulds were for ingots of the D-shaped cross-section; fewer of them for ingots of triangular or square cross-section. Resi has compared the moulds with the shape of known bronze and silver ingots from Hedeby and notes that the bronze ingots are usually longer and broader than the cavity in the moulds. These correspond more closely to ingots of lead or silver. Resi (1979:58–64) also refers to Norwegian finds which indicate that silver ingots were usually cast in soapstone moulds. Moulds of this type are known from various Viking-age contexts. From the Kaupang excavations we have moulds of soapstone and clay. At least some of the soapstone moulds were intended for casting ingots, mostly of a D-shaped cross-section (information kindly supplied by Unn Pedersen, who will publish this material).

Wiechmann has classified cast, unworked ingots as Type 1. These are of D-shaped, triangular, trapezoid or rectangular cross-section. The Kaupang ingots fit well into Wiechmann's Type 1. Wiechmann demonstrates that this type of ingot belongs mainly to the historically Danish territories but is also plentiful on Gotland. They are almost totally absent from the Swedish mainland north of Skåne, however, but do also occur in the West Slavic region and in Latvia. Wiechmann's map also shows a striking concentration in the south-east of Ireland. In Norway they are concentrated in silver hoards in the Oslofjord area (Wiechmann 1996:65–7 and karte 76).

The weights of ingots have often been noticed, as they seem to belong to more or less definite weight-groups. The most evident weight-groups concentrate around 25, 50 and 100 g. Amongst the Southern Norwegian hoards the one from Grimestad, Stokke, Vestfold (C26387) is especially interesting in this respect. This hoard contained 77 Islamic coins with a t.p.q. of 921 (Skaare 1976:138). The unminted silver consisted of a collection of armrings, some large and simple arm hoops made of heavy ingots, fragments of one or more neckrings, rods, six ingots of D-shaped cross-section and one complete ingot with traces of hammering at both sides.

The hoard also contained some silver fragments but too few for the hoard to be referred to as a hack-silver hoard. Three of the ingots relate to a weight around 50 g and one weighs 92.8 g. Several of the armrings are large and heavy and many are so simply made that it is difficult to decide whether to classify them as pieces of jewellery or ingots. These rings are most apt for comparison with the so-called "ring-money" that is a well-known phenomenon in the British Isles, mainly from Scottish finds (Graham-Campbell 1995:57). A hoard from the Tønsberg area in Vestfold (C10527–31) has many similarities to the Grimestad hoard. It consists of three heavy armrings of the same type as in Grimestad, together with two cast ingots, both of them cut at one end, weighing 95.2 and 96.6 g respectively.

Both the Grimestad and the Tønsberg hoards thus contain ingots, some of which seem to have been cast according to fixed weight-units, together with some rings that may be referred to as ring-money. It is therefore possible to regard them as collections of large units of currency (Hårdh 1996:144–5). Ingots of the same type, complete and/or in fragments also come from the hoards from Lahell, Lier, Buskerud (C6262–64, C9262–83 and C9855–58) and Vela, Sand, Rogaland (B4318).



Skaare has shown that three out of five complete ingots from four Norwegian hoards weigh between 44.8 and 49.0 g. One ingot in the group weighs 92.8 g and thus about double that of the previous group. According to Skaare the rings seem to be weight-adjusted too, although the picture in this respect is less clear (Skaare 1976:50 and tab. 13; Hårdh 1996:58–65 and 145).

5.6.1 The large Kaupang ingot

The largest ingot, C52517/579, with an almost rectangular cross-section, rounded corners and rounded ends, weighs 48.277 g. This weight can be compared directly with silver ingots and a group of silver ring jewellery that were apparently manufactured in accordance with fixed weight-standards (Hårdh 1996:137–46).

Ingots from two hoards from Schleswig-Holstein, at Rantrum and Witzworth, are often the subject of attention in the discussion of weight-units in the Viking Age. The ingots from these two hoards are convincingly grouped around 50 and 100 g (Kruse 1988:28; Wiechmann 1996:424 and 528). The dating of the hoards is unlikely to be later than around 900 or the first half of the 10th century. The Rantrum hoard contains thirteen coins with a t.p.q. of 873, and Witzworth, with a similar assemblage of objects but no coins, must be contemporary (Wiechmann 1996: 423 and 527). There are two more hoards from Schleswig-Holstein, at Giekau and Oldenburg II, which are of interest in this respect. They contain ingots, the weights of some being around 100 g, double that of the Kaupang ingot, and others around 25 g, half of the Kaupang ingot. The majority, however, weigh around 50 g (Wiechmann 1996:239 and 396). Ingots from a hoard at Asarve, Gotland (SHM 11930), also correspond to this pattern with a striking predominance of weights around 50, 100 and 200 g.

The Giekau hoard contained 401 coins with a t.p.q. of 921/922. The Oldenburg II hoard is reported to have contained 5,500 coins of which only two are preserved, the latest of them a German coin dated 1038–1045. In the Asarve hoard there were two Abbasid dirhams, AD 777/8–787/8 and AD 875/6? (dated by G. Rispling).

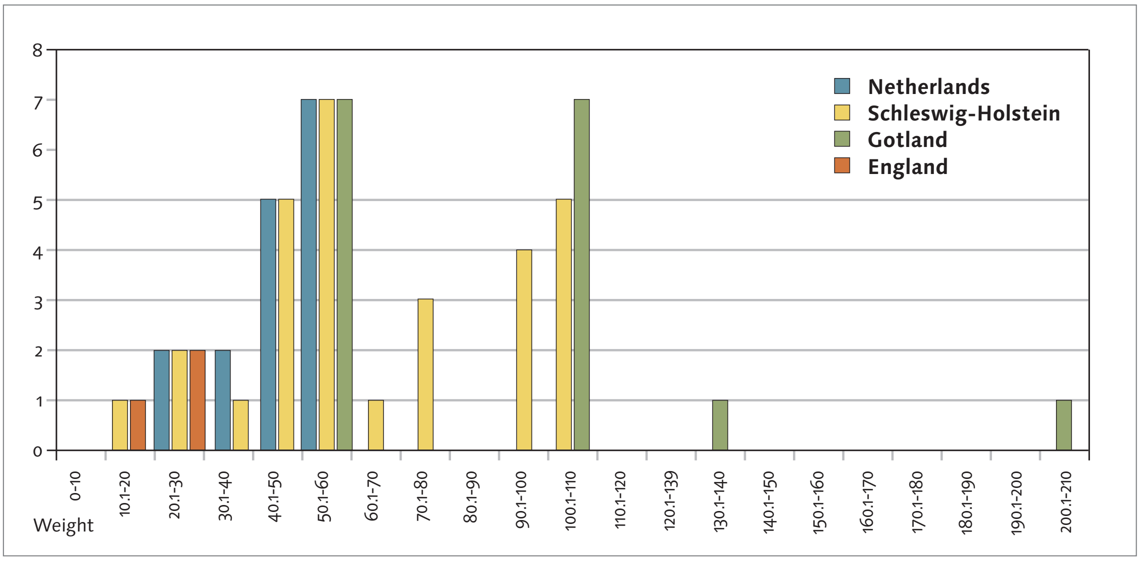
The Westerklief I hoard has several similarities with the hoards from Schleswig-Holstein and Gotland. It consisted of silver jewellery, ingots and coins, and was deposited in a ceramic pot of the Badorf ware. The coins, 78 Carolingian denarii, date the hoard to c. AD 850 (Besteman 1997, 1999). The Westerklief hoard contains sixteen complete ingots, which also fit well into the pattern described above (Besteman 1997:209, diagram 1 and 2, 1999:257, fig. 17 and tab. 4).

Kruse has analysed the weights of ingots from English and Welsh hoards from the late 9th and early 10th centuries. In contrast to the Continental ingots these do not show any distinct groupings according to weight, although there is a clustering in the zone around 25 g. Particularly significant is the absence of peaks around 50 or 100 g (Kruse 1988:293, 1995:193). Two of the three complete ingots from the 9th-century hoard from Croydon, Surrey, have weights of 22.39 and 23.74 g (Brooks and Graham-Campbell 2000:92). This is slightly less than half the average weight of the majority of the ingots from Schleswig-Holstein. The hoard Dysart 4, from Co. Westmeath, Ireland, deposited early in the 10th century, contains five complete ingots, two of which are reported to correspond to an "øre" unit of 24–6 g. A third ingot has, interestingly enough, a small silver blob added to it to produce a total weight of 51.1 g (Ryan et al. 1984:339). Thus there may be a connection between the weights of ingots from Continental 9th-century hoards and contemporary ingots in Britain and Ireland. As Kruse points out, the concern to manufacture objects within precise weight-limits was much more common in the East and in the Arab

Schleswig-Holstein	
Oldenburg II	109
Giekau	18.22, 24.99, 78.98
Rantrum I	28.88, 34.2, 48.7, 48.96, 49.01, 49.91, 50.77, 51.01, 51.76, 66.43, 78.73, 98.32, 98.74, 99.74, 100.78, 101.20, 102.12
Wizwort	49.44, 49.90, 51.01, 51.35, 51.35, 57.78, 76.51, 99.99, 102.03
Gotland	
Asarve	50.27, 53.2, 56.67, 59.36, 100.9, 101.10, 101.23, 102.1, 105.9, 106, 107.2, 146.62, 203.17
The Netherlands	
Westerklief	21.3, 25.8, 30.4, 37.2, 48.4, 48.6, 48.6, 48.6, 50.0, 50.2, 51.6, 52.2, 52.8, 53.9, 54.2, 55.5
England	
Croydon, Surrey	16.60, 22.39, 23.74

Table 5.6 *Weight ranges in grammes of complete ingots in selected early Viking-age hoards (Hårdh 1996; Wiechmann 1996; Besteman 1997, 1999; Brooks and Graham-Campbell 2000).*

Figure 5.8 *Diagram of weight ranges in grammes of the ingots in Table 5.6.*



Empire than in Viking-age Scandinavia. The English and Welsh ingots which Kruse has analysed clearly show that accuracy of weight was of lesser importance (Kruse 1988:296–7).

Table 5.6 gives an overview of the range of weights of complete ingots from a number of hoards. Besteman, in his discussion of weight relations amongst cast silver ingots, emphasizes the pattern already pointed out by Kruse and others. Ingots in Danish and Norwegian hoards seem to concentrate around 50 g, while ingots in British hoards of Scandinavian character generally appear to weigh c. 25 g. (Besteman 1999:257 with refs.). The Kaupang ingot thus corresponds with the majority of the Westerklief ingots and a considerable number of those from Rantrum and Witzwort (Wiechmann 1996:424, tab. 45, 528, tab. 59; Besteman 1997, 1999), as well as with the Gotland specimens.

According to the dating of the hoards, non-fragmented, weight-adjusted ingots of this type seem to belong mainly to the 9th century. As the unit of 50 g is not at all pronounced amongst ingots from Britain there is no immediate reason to think that the Kaupang ingot originated there. Ingots of this weight-group concentrate rather in South-Western Scandinavia and the north-western parts of the Continent. This would appear to be the context to which the Kaupang ingot, as well as some of the ingots from Norwegian hoards such as that at Grimestad, belong.

5.6.2 The small Kaupang ingots

The other four complete ingots from Kaupang are considerably smaller (Fig. 5.9). C52517/2043, which has some traces of hammering and rounded ends, weighs 2.98 g. This is an interesting weight. Brøgger (1921:23 and 25) claimed to have identified a weight-unit lying between 2.7 and 3.1 g, corresponding to three Roman scrupula. One ingot, C52517/334, weighs 1.50 g. This could of course be a fraction of a weight around 3 grammes. The third and fourth ingots, C52517/584 and C52519/10375, weigh 3.77 g and 1.81 g respectively. Whether these two were adjusted to a certain weight-unit or not is hard to decide.

Skaare has collected the weights of the unminted silver from four Norwegian silver hoards with exclusively Islamic coins: Grimmen, Teisen, Voie and Vela. He surveyed the weights from cut silver pieces and also the bronze and lead weights (Skaare 1976:50). These figures reveal groupings which could show that the hacksilver was fragmented according to standardized weights. However, the tolerance within Skaare's weight-groups is large, and with the very small intervals used it is easy to create groups which may not be genuine or significant. None of these hoards, moreover, fulfil the strict criteria that I used for my investigation of fragmentation of the hacksilver hoards in 1996 (Hårdh 1996:93). There is some correspondence between the weights given by Skaare and the Kaupang ingots but not enough to be convincing.

Kyhlberg has analysed cubo-octahedral weights under 4.9 g from Birka. They seem to cluster around 2.5, 2.8, 3.7, 4.3 and 4.6 g (Kyhlberg 1980b:261). In her survey of postulated weight-units in the Viking Age, Kruse indicates that units of 4.0, 4.25 and 4.26 g might be of interest (Kruse 1988:296 and tab. 2). On the basis of Swedish finds of weights, Sperber (1996: 110–11) concluded that the Swedish/Islamic system which was functioning at the end of the 9th and the beginning of the 10th century used a unit of 12.7 g with fractions of 6.35, 3.17, 1.59 and 0.8 g. Steuer (1997: 283–5), also basing himself upon an analysis of cubo-octahedral weights, perceived a unit of 4.25 g, but the basic unit in the Viking Age might, in his view, have been 0.35 or 0.71 g. With the uncertainty that is typical of Viking-age weight-systems I find it impossible to determine whether the small Kaupang ingots were made in accordance with specific weight-units or not.

Figure 5.9 *Small ingots, C52517/584, C52517/2043 and C52517/334. Photo, Eirik Irgens Johnsen, KHM.*

Figure 5.10 *Spiral-striated rods, C52517/408, C52517/469, C52517/1088, C52519/14893 and C52519/17264. Photo, Eirik Irgens Johnsen, KHM.*

5.6.3 A local production of ingots?

The ingots from Kaupang belong, as noted, to Wiechmann's Type 1: cast, unworked ingots with cross-sections of various shapes. One of them, however, shows, as mentioned above, a couple of traces of hammering. All of the complete and most of the fragments of the ingots from Kaupang are of rectangular cross-section, while a couple of fragments have trapezoid or oval cross-sections. In the material from Schleswig-Holstein that Wiechmann presents ingots of D-shaped cross-section are predominant, comprising 60% of the collected material. Many of the ingots from Schleswig-Holstein also have either a triangular or a trapezoid cross-section, while ingots of square cross-section make up only 4% (Wiechmann 1996:66).

The ingots from Kaupang thus manifestly differ from those from North-Western Germany. It is also interesting to see that all but one of the ingots from the Grimestad hoard are of D-shaped cross-section. The exception had been hammered to a rectangular cross-section. Likewise the two ingots in a hoard from the Tønsberg area are of D-shaped cross-section. The hoard from Lahell, Lier, Buskerud, contained a mixture of ingots of D-shaped and rectangular cross-section, while that from Nordrum, Vestfold (t.p.q. 1065, C17646) contained a fragment of an ingot similar to those from Kaupang.

Ingots of D-shaped cross-section are well known in Ireland and the British Isles too (Wiechmann 1996:karte 76; Brooks and Graham-Campbell 2000: 73). In Britain ingots of triangular or squared triangular cross-section are also commonly found (Blackburn and Rogerson 1993:223). The almost total preponderance of ingots of square cross-section at Kaupang thus contrasts with ingots from other areas.

About 25 soapstone moulds have been found in the Kaupang settlement during both Blindheim's and Skre's excavations. Several of these have grooves, often more than one, suited to the casting of ingots. It is clear that the majority of these would produce ingots of D-shaped, triangular or trapezoid cross-section. A few moulds have grooves with almost straight sides and one is clearly rectangular (Pedersen, in prep.). This could mean that the ingots found at Kaupang were locally produced, probably at the site. It is striking that the majority of ingots from silver hoards in Southern Norway are of D-shaped cross-section and thus related rather to those from Schleswig-Holstein. The large Kaupang ingot, if produced in Kaupang, also testifies to a connection with weight-units current in Denmark and Schleswig-Holstein amongst other areas.

5.7 Spiral-striated rods

Amongst the finds from the new work at Kaupang there are ten silver rods decorated with striation spiralling around the rod. The rods are round in cross-section and 4.2–4.5 mm thick (C52517/408, C52517/466, C52517/469, C52517/998, C52517/1088, C52517/2442, C52519/14893, C52519/14913, C52519/15819 and C52519/17264). To these, two examples from the Blindheim excavation can be added. One of these is reported to be 4 mm thick and the other is slightly thicker, at 5 mm (inf. in KHM).

Spiral-striated silver rods occur occasionally in Scandinavian silver hoards and may derive from rings of what is known as the Permian type: neck-rings with a catch formed by of a polyhedric knob and a loop. In Scandinavian finds these are usually, when complete, wound into spirals suitable for arm-rings. In a complete state this type of ring occurs only on Gotland and Öland besides four specimens in the find from Erridsø in South Jutland. Of the rings from Gotland, a considerable number belong to the above-mentioned hoard from Asarve, Hemse, and from the very large hoards from Spillings, Othem. An almost complete ring of the same type is also known from

the island of Sylt (Wiechmann 1996:cat. no. 41 A). Two large fragments have been found in Norway, at Torrvik, Volda, Møre og Romsdal (B7799). Outside of Scandinavia, rings of this type show a marked concentration in Russia, west of the Ural mountains in the administrative districts of Perm and Vijatka, from where at least a hundred complete and many fragments of such silver rings are known (the State Historical Museums in Moscow and St Petersburg). The rings were made to accord with standardized weight-groupings and are obviously to be regarded as a form of currency in large units of around 400, 300, 200 or 100 g. The heaviest rings are to be found in Russia while the rings found in Scandinavia mostly weigh around 200 or 100 g (Hårdh 1996:137–40 with refs., 2007).

A related type of spiral-striated ring, smaller and with thinner rods, usually has both ends bent to form hooks, often of swan-neck shape. Rings of this type occur in the hoard from Duesminde I, Lolland

Figure 5.11 *Rings from the hoard from Duesminde I, Lolland. Photo, National Museum of Denmark.*

(Munksgaard 1963, 1965, 1980. NB: this is not the same hoard as the Duesminde II hoard with Carolingian items already mentioned). These smaller spiral-striated rings are also weight-adjusted and, moreover, correspond to the ingots mentioned above with weights around 100 or 50 g (Hårdh 1996:139 with refs.). The thickness of the Kaupang rods indicates that they derive from this smaller Duesminde I type of ring. Interestingly enough the slightly thicker rod from the Blindheim excavations might be a fragment from the thicker, typical Permian type of ring, which is otherwise known in Norway only in the Torrvik hoard.

The spiral-striated rings belong to the early Viking Age. The Permian type has been found on Gotland together with Abbasid dirhams in hoards from the 9th century and the beginning of the 10th (Norrgårda, Björke, SHM 12328, t.p.q. 833/834: Brather 1997:128; Spillings, Othem t.p.q. 870/871: Rispling 2004c; Hellvi, SHM 1124, t.p.q. 921: Stenberger 1947: 111–2). The Duesminde I hoard, together with some related hoards from Denmark (including Viby, c. 10 km south of Roskilde, with two straightened rings found together around 1850. NM 11332), has been ascribed to what is regarded as the earliest group of Danish silver hoards, dated mainly to the 9th century (Skovmand 1942:28–43; Holm Sørensen 1989). A fragment of a ring of the same type was included in a hoard from Sønder Kirkeby, Falster, t.p.q. 846 (NM 8433: Skovmand 1942:35; Munksgaard 1963:98). Rings of the Duesminde I type have been found in Gotlandic hoards of the 9th century (Rune, Sanda, SHM 12622, t.p.q. 861: Stenberger 1947:182–3; Spillings, Othem, t.p.q. 870/871: Rispling 2004c). Spiral-striated fragments are also known from the British hoards of Cuerdale, Croydon and Storr Rock, and from the Irish hoard of Co. Dublin, all dated between 872 and 935 (Sheehan 1998:185; Brooks and Graham-Campbell 2000:75). In Scandinavian 10th-century silver hoards spiral-striated rods are quite common (see, e.g., Hårdh 1976).

The close relationship between ingots and spiral-striated rings is obvious from their distribution concentrated in South-Western Scandinavia and Gotland. They also occur often in the same hoards, as in those from Gotland mentioned above, such as Asarve, Hemse (Stenberger 1947:119–21 and abb. 1–7), Spillings, Othem, and from Schleswig-Holstein, i.e. Rantrum I and Witzworth (Wiechmann 1996:cat no. 33 A, 48 A).

Spiral-striated rods of the same type as those from Kaupang, rather thin rods around 4 mm in diameter, are known from several settlement sites in South-Western Scandinavia, including Uppåkra and Jyllinge, Kirke Hyllinge and Strøby on Zealand, where they occur with, *inter alia,* fragmented Islamic coins (Ulriksen 1998:fig. 90; Tornbjerg 1998:fig. 2; Hårdh in prep.a).

The spiral-striated rings constitute an interesting and challenging body of material. The bigger type, the so-called Permian rings, are clearly concentrated in Russia, spilling over into the Baltic region, especially the islands of Öland and Gotland. They are, as mentioned, weight-adjusted and are certainly to be regarded as a means of payment in large units. Their weight has been connected to fractions of the Russian pound of c. 408 g (Lundström 1973:76; Schrötter 1930: 237–8; Bauer 1931:99). The smaller type, from which the Kaupang fragments probably derive, conversely has its main distribution on Gotland and in Denmark. The weight of these rings usually lies around 50 g, occasionally around 100 g, and corresponds, as noted, to the weight-adjusted ingots that have a clear focus in Schleswig-Holstein, a concentration further strengthened by the recent Frisian find at Westerklief. Conversely, I have not been able to identify a single example of this type from the area of Russia, either in the collections of the State Museums in

Figure 5.12 *Stamp-decorated rods C52519/14955, C52519/15036 and C52519/15562. Photo, Eirik Irgens Johnsen, KHM.*

Figure 5.13 *Two of the four fragments of grooved armrings, C52517/194 and C52519/14058. Photo, Eirik Irgens Johnsen, KHM.*

Figure 5.14 *Fragments of arm- or neckrings, C52517/2054, C52517/1954 and C25217/2151. Photo, Eirik Irgens Johnsen, KHM.*

Moscow and St Petersburg or in any publication.

The weight-analysis shows that the weights of the smaller ring-type could well be fractions of the weight-groupings of the bigger rings, so that the two types of rings could pertain to a single weight-system. If, however, the small rings are of South-Western Scandinavian manufacture, the Scandinavian "mark" weight should be considered too. The Scandinavian "mark" has been estimated at around 200 g, which makes it difficult to decide which weight-system is in question. In his analysis of the rings from the gold hoard from Hoen, Buskerud, Graham-Campbell established a weight-unit of c. 100 g for the rings. He thinks that the Hoen rings were made in South-Western Scandinavia and that their weights correspond well with those of gold rings from the Vester Vedsted hoard, Jutland (NM 18272–84, 18374–8, 18571–3, 12/33). This may show that a weight-unit from present day Russia, possibly the Perm region, as expressed in the Permian rings, had been adopted by Scandinavian goldsmiths (Graham-Campbell 1999: 63–4).

The rings of the Duesminde I type, as presented by Munksgaard (1963, 1965, 1970), are decorated in turn with spiral-striated and stamp-decorated sections. Amongst the hacksilver pieces from Kaupang there are three rods, round in cross-section and with stamped decoration: C52519/14955, C52519/15036 and C52519/15562 (Fig. 5.12). The thickness of these rods, their decoration, and the general character of the pieces, render it probable that they should be associated with the spiral-striated rods also belonging to rings of the Duesminde I type, and thus reinforcing the presence of this group. It may also be noted that the rods in the above-mentioned hoard from Croydon, Surrey, in addition to striation have stamped decoration similar to that on rings of the Duesminde I type and thus further to these rods from Kaupang (Brooks and Graham-Campbell 2000:fig 16).

5.8 Fragmented jewellery

Some hacksilver pieces derive from fragmented silver jewellery, the original type of which can be identified with greater or lesser confidence. Several fragments are obviously, and others probably, from armrings.

Four fragments are parts of armrings decorated with rows of transverse stamped grooves: C52517/194, C52517/207, C52517/792 and C52519/14058 (Fig. 5.13). The fragments C52517/194 and C52519/14058 are 4.2 cm and 2.8 cm long respectively, and both are cut at both ends. Transverse stamped armrings are a well-known feature of Viking-age silver hoards. Norwegian hoards include Vela, Sand, Rogaland; Slemmedal, Aust-Agder (C36000); the hoard from the Tønsberg region; Grimestad, Stokke, Vestfold (C26387); Os Churchyard, Østfold (C2409); and the hoard from Torrvik, Møre og Romsdal, the last of which also contains the two large fragments of Permian rings mentioned above. All of these hoards are either dated by coins to the first half of the 10th century or have a generally early character. The hoard from Os contains two Islamic coins from the 8th and early 9th centuries (Skaare 1976:128). A number of Danish hoards also contain rings of this type: Hørdum, Hassing, Ty; Illebølle, Lindelse, Langeland; Tostrup, Keldby, Møn (Skovmand 1942:28–37); Duesminde I, Lolland; and Keldbyholm, Odense amt (Munksgaard 1970). Such rings are all in hoards which both Skovmand and Munksgaard classified as hoards of the earliest phase of the Viking Age, the 9th century. They are also known from Scottish and Irish hoards. The variant of these rings found in the British Isles and Ireland is usually referred to as the Hiberno-Norse broad-band type (Sheehan 1998:194–5). In both Scotland and Ireland they belong to the period AD 850–950 (Sheehan 1990:fig. 1, 1992:42 and tab. 2, 2001:52 and figs. 1–2; Graham-Campbell 1995:58 and pl. 6–7). Broad-band armrings are, however, also known from 9th-century contexts in the Baltic region: for example from the Gotlandic hoards from Spillings. Referring to the early appearance of these rings in some Danish hoards, Brooks and Graham-Campbell suggest that the origin of the type should be sought in Denmark (Sheehan 1998:195; Brooks and Graham-Campbell 2000:76).

Sheehan points out that a certain type of stamp, a bar punch with serrated edges, occurs in Ireland as well as in Denmark. As an example he refers to the hoard from Keldbyholm (Sheehan 1998:195, 2001:58). This type of stamp also occurs on fragment C52519/14058. Sheehan sees correspondences in stamp-types as evidence of close contacts in silver craft between Denmark and Ireland. It is of interest to note that these rings, with their clear concentration in Denmark and the Hiberno-Norse region, are also so strongly represented in the southern parts of Norway. This clearly shows the flow of objects, ideas and manufacturing traditions that was transmitted around South-Western Scandinavia, Southern Norway and Ireland in the 9th century (Sheehan 1998:177–8).

The Kaupang silver also includes several smooth, ribbon-shaped fragments. In several cases it is obvious or at least probable that these derive from armrings, tapering at one end, for example C52517/498, C52517/764, C42517/2130, C52519/15558 and C52519/38340. Such simple, undecorated armrings, which sometimes resemble hammered ingots rather than jewellery, occur in silver hoards from the early Viking Age such as the Western Scanian hoard at Heljarp with Carolingian mounts and coins of the 9th century (LUHM 15035–41: Hårdh 1976:cat. no. 130).

There are some ribbon-shaped and stamp-decorated rods which also derive, with more or less certainty, from armrings: C52517/622, C52517/880, C52517/2120, C52617/2191 and C52517/2739.

C52517/2054 consists of two fragments of rods, with a round cross-section, twisted around each other in a knot (Fig. 5.14). The knot is of a type that is the most common type of lock on armrings of the Scandinavian type. The hoard from Haug, Eiker, Buskerud, mentioned above, contained a fragment similar to the Kaupang piece. To the same group of jewellery belong some rods with a round or slightly faceted cross-section that are twisted like a screw. These derive from arm- or neckrings made of two or more twisted rods. C25217/2151 consists of two rods of round cross-section twisted around one another (Fig. 5.14). This is also, in all probability, a fragment of a neck- or armring. C52517/1954 is a rod of faceted cross-section, twisted and bent (Fig. 5.14). It too is obviously part of a twisted arm- or neckring. These arm- and neckrings are abundant, complete or in fragments, in the silver hoards. Coin-dated hoards, such as that from Westerklief, indicate that they were manufactured before the mid-9th century (Graham-Campbell 1999:60–1). In Scandinavia they occur in hoards dated up to the 11th or even the early 12th centuries (Hårdh 1976). These too were in all probability made in various parts of Scandinavia and the Baltic region.

5.9 Hacksilver from well-dated contexts

The fragmented coins from Kaupang are mostly very early in date, largely from the 8th and 9th centuries. This also corresponds well with the record from Uppåkra, where a high proportion of Abbasid dirhams were found together with Carolingian coins. This does not, however, tell us when the coins were either brought to the find places or when they were cut up, used or lost. For the question of the use of silver as a means of payment, hacksilver or fragmented coins from well-dated contexts are of crucial importance. At Kaupang 32 pieces of non-minted silver have been found in undisturbed contexts and 13 of these have been related to a Site Period (SP). A corroded fragment which cannot be classified more precisely was found in a layer belonging to SP I in plot 2A. From plot 1B, SP II sub-phase 1 there is a small, ball-shaped fragment of 1.05 g. The majority of pieces in dated contexts belong to SP II sub-phase 2, which is dated to around 850 or perhaps one or two decades earlier. A rod, round in cross-section and cut at both ends, with a weight of 4.55 g, may derive from a neck- or armring. Another piece is a flat rod, probably cut at one end, weighing 0.44 g. Of greatest importance is the fact that one of the above-mentioned spiral-striated rods, C52519/17264, weighing 1.3 g, can also be assigned to SP II sub-phase 2. A fourth piece of rod weighs 1.7 g. These four pieces were all found in plot 3B. One piece of rod, weighing 0.71 g, came from plot 2B, SP II, sub-phase 2. Fragments of silver from SP II sub-phase 2 have also been found in plots 2A, 2B and 3B.

With this extremely small collection of material it is, of course, impossible to identify the original use of the small silver pieces. There are indications of metal handicraft in connection with one of the pieces, and it is not impossible that the pieces represent workshop residue. However, the pieces of cut rod correspond closely with the hacksilver pieces in hoards, and the striated rod is certainly from a ring of the Duesminde I type. Some of these rings have, as noted, been found in hoards dated by coins to the 9th century. The Kaupang fragment, dated by stratigraphy, thus corresponds well with the coin-dated rings of the same type. Another rod of the same striated type, C52516/3272, was also found in an undisturbed context, although not within an identifiable phase. It is also worthy of notice that a rod of square cross-section was found in the same layer as a coin of Louis the Pious. The silver from dated contexts will be discussed further below, together with the evidence of the coins.

5.10 Discussion

The majority of the hacksilver from Kaupang consists of fragments of rods or sheet metal. The fragmentation is pronounced, and most of the pieces weigh no more than one or two grammes. Important to a discussion about the use of the hacksilver is whether or not it has been pecked to test the quality of the silver. This is often the case with silver objects and coins from hoards. The hacksilver from Kaupang has been scrutinized in order to identify such pecks but no certain marks of the sort have been found. This could possibly be a chronological characteristic. Pecking is apparently common on European and Islamic coins in mixed hoards, and thus is a phenomenon to be associated with the later 10th century (Malmer CNS:vol.3:XVIII).

The pieces of hacksilver from Kaupang are generally difficult if not impossible to date, and their origin is equally obscure. Those fragments which belong to types that *can* be identified have parallels in silver hoards dated mainly to the 9th or the first half of the 10th centuries. Amongst the early objects are the thin, spiral-striated rods, which derive from a smaller and simpler variant of the rings usually known as "Permian". This type of ring is referred to here as the "Duesminde" type. Such rings are known from Denmark and Gotland and fragments of the same type as found at Kaupang also occur at other settlements in South-Western Scandinavia. It may also be fragments of this type of ring that occur in the Croydon hoard in England. The "Duesminde" type of ring is related to the "Permian" rings both typologically and chronologically. But even if there were an Eastern connection for them, the majority of complete rings and fragments is clearly concentrated in South-Western Scandinavian. It is thus highly probable that the Kaupang rods demonstrate contacts with South-Western Scandinavia, which means, first and foremost, Denmark. The same holds true in part for the ingots. Irrespective of whether or not they were locally produced, the one large ingot at least reveals, through its weight, a connection with weight-adjusted ingots of South-Western Scandinavia and the north-western part of the Continent.

The ribbon-shaped fragments with transverse stamped patterns represent a type of armring that is well known in Danish hoards from the early Viking Age, and in Ireland, England and Scotland. The prototype of the Hiberno-Norse broad-band armrings found in Ireland and Britain is to be found in Denmark. The rings reveal close contact in silverworking between the Hiberno-Norse area and Denmark in the early Viking Age. Contacts between the Baltic region and Ireland and Britain, manifested in, for instance, Islamic coins and Permian type rings, went via Denmark (Sheehan 1998:187–8, 2001:58–9).

The striated rods and the fragments of ribbon-shaped, usually transversely grooved armrings, together with ingots, are a distinct element in hoards from the 9th century found in Denmark, Schleswig-Holstein and occasionally in Britain and Ireland. They thus provide a clear picture of the high level of mobility of silver in the Viking Age, besides linking up this vast region (Sheehan 1998:184).

Other pieces of hacksilver from Kaupang are fragments that derive from common Scandinavian types of jewellery, arm- or neckrings, which were produced in various parts of Scandinavia over a long period of time. They are a significant feature of hacksilver hoards, principally in the 9th and 10th centuries.

It is certainly difficult to state with confidence what the function of the hacksilver from Kaupang was. There are, however, good reasons to argue that at least a considerable part of it was used as currency. Kaupang is a site characterized by international contacts and conspicuous handicraft, and it is therefore reasonable to suppose that currency in the form of weighed silver was used there. The majority of the coins and the coin fragments are certainly to be interpreted this way, and the same holds for a large part of the non-minted fragments. Comparisons with the silver hoards from the Oslofjord area are revealing in this regard. The hoard from Teisen, Ø. Aker, Oslo, with a t.p.q. of 932, is quite an early hacksilver hoard, containing seven armrings together with hacksilver, 36% of the fragments of which weigh less than 1 g and 60% less than 2 g (the date of the hoard is according to new analysis, see Kilger, this vol. Ch. 7:201). This corresponds closely to the weights of the hacksilver fragments at Kaupang. This hoard belongs to a group of early hacksilver hoards from Western Sweden and Denmark that are evidence of the use of silver as a currency in the early 10th century in South-Western Scandinavia and in South Jutland in particular (Hårdh 1996:213 and tab. 23). Of course the silver from trading places, representing a wide variety of situations in which such small valuable objects could be lost, can only be compared with a deposited hoard with specific reservations. There is nonetheless a high degree of similarity in appearance, which implies a similarity of function.

The occurrence, at Kaupang, of ingots and ingot-fragments, as well as fragments of striated and stamp-decorated rods from weight-adjusted rings, speaks for the silver being valued according to weight. Thus coins, ingots and hacksilver are to be interpreted in the same way. It is most probable that there was a well-developed consciousness that these represented certain units of value that could be utilized in transactions.

A most important question for understanding the nature of Kaupang as a phenomenon is that of when silver started to be used as currency. Do the hacksilver hoards in the region also date the hacksilver from the Kaupang settlement site? How should

we understand the relationship between the silver in the hoards and the silver from the town? The range of coins in the Kaupang settlement, which is immediately very similar to that at Uppåkra and Birka, has a considerably earlier profile than in the hoards. Typical of all three of these sites is a predominance of Abbasids struck before 890, and the even earlier group of Ummayads (see further Blackburn, this vol. Ch. 3:45–51, Appendix 3.2; Kilger, this vol. Ch. 7:201–5). This differs strikingly from the average pattern of the hoards, where c. 75% of the Islamic coins found in Norway were struck between 890 and 950. In the hoard from Grimestad, t.p.q. 921, dirhams struck before 890 constitute only 9% of the coins (Skaare 1976:48–9 and tab. 12). Skaare has demonstrated that when Islamic coins were imported to Norway, especially between 890 and 950, they were distributed to all parts of the country. From this period onwards coins appear regularly in the silver hoards. Skaare maintains that from this date, coined silver came to be appreciated as a convenient means of payment in a weight economy (Skaare 1976:53. For a different view, see Kilger, this vol. Ch. 7:242). This scenario is, however, based on the evidence of the silver hoards. The coins retrieved from the Kaupang settlement require us to reconsider the development of the silver economy, taking the urban sites into special consideration.

In this respect, it is of the utmost importance that at Kaupang, as at Birka, it is possible to connect both hacksilver and coins with datable contexts. Unfortunately, there are very few pieces of hacksilver which can be closely dated (Gustin 1998). However, in Kaupang a number of pieces that could have been used as currency come from contexts dated to the middle of the 9th century. With a couple of exceptions, these pieces cannot be derived from identified types of object, but one fragment of a spiral-striated ring is an important piece of evidence. The rest of the silver comes from the medieval or the modern plough soil. The 92 dirhams from Kaupang were also found in unstratified contexts. But, importantly, there are three 9th-century Western coins from early, stratified contexts, retrieved in both Blindheim's and Skre's excavations (Blackburn, this vol. Ch. 3:31–2; Rispling et al., this vol. Ch. 4:Nos. 6–11).

In 1996 I made a regional division of Scandinavia and the Baltic area on the basis of the Viking-age silver hoards. In this, Kaupang belongs to Region 2, which includes Western Sweden (Halland, Bohuslän and Västergötland), together with South-Eastern

Figure 5.15 *The hoard from Önum, Västergötland. Photo, Museum of National Antiquities, Stockholm.*

Norway, especially the Oslofjord area. Within this region there are several highly fragmented silver hoards of early date such as Stavsinge in Halland, t.p.q. 916 (SHM 614), Sandvikstorp, Harestad, Bohuslän, t.p.q. 916 (SHM 3091), and Teisen, Ø. Aker, t.p.q. 932 (Hårdh 1996:98–9). All these hoards contain intensely fragmented silver, with more than 20% of the fragments weighing less than a gramme. As noted, this type of hoard is probably a collection of currency. Moreover, the extremely small fragments indicate a well-established economy in which silver was regularly used as currency even in minor transactions of everyday character (Hårdh 1996:84–6, 123). The regions with hoards showing the most pronounced fragmentation are Denmark with Skåne, Western Sweden, and the West Slavic region, i.e. what is now North-Western Poland and North-Eastern Germany. Hacksilver hoards from this region dated to the last decades of the 10th century and the early 11th regularly contain small fragments of West Slavic jewellery. These are quite distinctive so that even the smallest fragments are easily identified. These characteristics are totally absent from Kaupang, which agrees well with the fact that 10th- and early 11th-century German and English pennies, typical of late Viking-age hoards in Scandinavia, are also missing here (Blackburn, this vol. Ch. 3:30).

The very early hacksilver hoards from Western Sweden and South-Eastern Norway must be considered in connection with what developed in South-Western Scandinavia, principally in Jutland and Schleswig-Holstein. The 9th-century hoards there are characterized by weight-adjusted rings and to some extent by weight-adjusted ingots. Single finds of coins struck in the 9th century involve Islamic and Carolingian issues. Indications of a local weight-based economy are seen in early hacksilver hoards from, for example, Vester Vedsted, West Jutland, t.p.q. 913, and the extremely early hacksilver hoard from Kettilstorp, Önum, Västergötland (Fig. 5.15), with its t.p.q. of 850 (SHM 4915: Hårdh 1996:134 and 161).

The Önum hoard is interesting in this regard. Beside a few pieces of hacksilver, it contained Islamic and Carolingian coins plus some cornelian and rock-crystal beads (Hårdh 1996:134). The new material from Kaupang also sheds new light on the hoard from Önum. With its t.p.q. in the middle of the 9th century and the mixture of Carolingian and Islamic coins, 10 coins and some fragments, the latter corresponds closely to the silver found at Kaupang. Important in this case is the fact that the hoard also contains some pieces of hacksilver, including a spiral-striated rod and a piece of a ribbon-shaped armring. Thus the hacksilver in the hoard likewise corresponds to what has been found at Kaupang, and the pieces mentioned are of the same early Viking-age types. The Önum hoard thus gives us an indication of the use of hacksilver in the 9th century in South-Western Scandinavia and rounds out the Kaupang evidence. Worth noticing, however, is that the early hoards of Vester Vedsted and Önum are not pure silver hoards as the later hacksilver hoards are. Both hoards contained hacksilver and coins but there was also a quantity of gold jewellery in the Vester Vedsted hoard, while the Önum hoard contained beads of various materials. This may indicate a partially ambiguous attitude towards silver as currency in this early phase. The hoards show that currency was hoarded together with other types of valuables, or even that other valuables, such as beads, could have been used as currency (Callmer 1977).

Together with some other hoards from neighbouring regions, amongst them the hoard from Färgelanda, Dalsland, the Önum hoard contained objects which reveal a connection with Western Continental Europe, i.e. the Carolingian Realm, in the early Viking Age (Hårdh 1996:134–5; also Arbman

1937b). The composition of coins in both the Önum hoard and Westerklief I also shows that Islamic and Carolingian coins circulated together in the mid-9th century in South-Western Scandinavia and Scandinavian-influenced parts of the Continent.

The Islamic coins from Kaupang, as well as from some other settlement sites such as Uppåkra, have an early profile compared with coins from hoards. At Kaupang, however, as well as at other settlement sites in South-Western Scandinavia, the coins derive mainly from unstratified contexts and it is consequently impossible to determine when they arrived. This notwithstanding, the coins from Kaupang contribute in an important way to the understanding of silver importation in the Early Viking Age. Blackburn (this vol. Ch. 3:3.15.a-c) has demonstrated, through comparative analysis, that the majority of the Kaupang dirhams must have been lost before 900 (for a somewhat different view, see Kilger, this vol. Ch. 7:239–40). Comparisons with the hoard from Lofthammar, Sweden, t.p.q. 865, and the records from Uppåkra, hint that the use of dirhams in the first half of the 9th century at Kaupang was not strong. If this had been the case one should expect a greater preponderance of earlier issues, as is the case at Uppåkra.

In contrast with the Islamic coins, Western European coins seem to have been present in the first half of the 9th century at Kaupang. The six Western European 9th-century coins all come from early stratified contexts and Blackburn concludes that they probably arrived in Scandinavia before 840. During the earliest phases, the coinage in Kaupang apparently consisted mainly of Western coins (Blackburn, this vol. Ch. 3:53; Skre, this vol. Ch. 10:347). Brather shows in his overview that coin hoards are relatively few in Northern Europe and East Central Europe in the 9th century (Brather 1997:98). These hoards are, as already noted, concentrated in present-day Sweden and further to the east.

As long ago as 1980, Callmer demonstrated, through an analysis of burial material from Birka, that for a considerable period of time there existed a coin stock, probably dominated by Oriental coins, which had little if any contact with the coin stock known from the hoards. Coins from this coin stock did end up in the graves. Callmer thinks that this coin stock was built up from c. 825 to the middle of the 9th century, and circulated at that time, being well suited for complicated transactions within a developed trading system. He maintains that this functionally motivated coin stock served a well-balanced system of exchange and was probably adopted at the majority of the leading trading centres in the early Viking Age. The period when this system functioned optimally was probably from the middle of the 9th century to the second third of the 10th century (Callmer 1980; Gustin 2004b:100; Kilger, this vol. Chs. 7:202). It is highly probable that it is precisely this coin stock which is now emerging from central places and trading places of the Viking Age. The diagram of the chronological distribution of the coins from the Grimestad and other early hoards compared with the coins from Kaupang and Uppåkra is illustrative of this (Blackburn, this vol. Ch. 3:Figs.3.6, 3.7, 3.10).

The evidence of the coins agrees very nicely with the results from the study of the hacksilver. The pieces can be dated only within broad limits but the overall impression is firmly that they belong to the earliest part of the Viking Age, first and foremost the 9th century and perhaps the beginning of the 10th. Important in this regard are also the small pieces of hacksilver found in a 9th-century grave at Bikjholberget which could have been used in trading transactions (Blindheim et al. 1999:119).

On the periphery of the Carolingian realm and the thriving North Sea trade, Southern Jutland, with Ribe and later Hedeby, emerged as an economic focal zone by the start of the Viking Age (Graham-Campbell 1999). The collected evidence from the early hacksilver hoards indicates that Western Sweden and the Oslofjord area were involved in the advanced economic activities that took place in this region, where contacts and impulses from east, west and north met, at least from the beginning of the 10th century. The new evidence from Kaupang shows that we can trace this economic integration back to the middle of the 9th century, and perhaps even earlier.

5.11 Summary

The conspicuous finds of hacksilver in plough-soil and stratified deposits at Kaupang are important for understanding the use of silver as a method of payment in the early Viking Age. The find-contexts indicate the circulation of hacksilver in the 9th century. Dated objects amongst the hacksilver also point to a dating in this earliest phase of the Viking Age and the assembled coins give the same early impression. Silver hoards, however, provide little evidence of the use of hacksilver earlier than the first part of the 10th century. With the new, reasonably well-dated evidence from Kaupang, it will now be possible to interpret early occurrences of hacksilver in hoards, while hacksilver in the plough-soil at Uppåkra and other settlements can also be discussed in a more systematic way. The types of objects from which the hacksilver is derived link 9th-century Kaupang with a wider Southern Scandinavian and Western European context.

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I wish to express my sincere thanks to Mark Blackburn, Christoph Kilger, Unn Pedersen and Dagfinn Skre who all read a preliminary draft of the chapter. Their comments contributed in many respects to the improvement of my text. Special thanks to my two unknown referees for all their valuable remarks.

Weights and balances 6

UNN PEDERSEN

The weights found at Kaupang 1998–2003 are presented here along with other weights and balances from the site, including cemetery finds. The overview includes descriptions of appliqués, identifications of types, and discussion of their chronological and spatial distribution. The material is compared with similar finds from Norway and other urban sites, particularly Birka and Ribe.

Noting its heterogeneous character, the material is related to the ongoing debate around Viking-period weights and balances. It is shown that lead weights first appear at Kaupang in the second quarter of the 9th century, which is thus parallel with the first appearance of hacksilver as currency in local trade. It is argued that the weighing equipment was probably used in several different forms of exchange. The considerable quantity of lead weights at the site also reflects their production here, and weights and balances very probably also functioned as equipment for metalcasting.

A change from the dominance of lead weights in the 9th century to that of specific types of copper-alloy or copper-alloy/iron weights in the 10th is suggested, but a reduction in the use of lead weights cannot be established beyond doubt. It is nevertheless argued that weights of both materials served functionally in a wide range of activities and had several layers of meaning attached to them. With an emphasis on the context of the Scandinavian Iron Age, the lead weights from Kaupang are seen as representatives of a (lead) weight-tradition deriving from the early Iron Age and continuing into the post-Viking Period. The shapes of new weight-types of other materials introduced in the second half of the 9th century were assimilated to this tradition.

A wide range of lead weights but only a few copper-alloy weights are sufficiently well preserved for their original weights to be used in a discussion of weight-standards. A considerable number of the lead weights are adjusted to c. 24, 12 or 8 g and thus correspond to the ertog-/øre-standard discussed by A. W. Brøgger in 1921. Weights of c. 4 g constitute the largest group and the punched-dot decoration found on several weights suggests that this could be regarded as another unit, closely related to the ertog/øre-standard. There is a smaller group of lead weights that are adjusted to c. 26 and 13 g, the older øre-standard proposed by Brøgger and Asgaut Steinnes. The material as a whole is nevertheless characterized by considerable variation, indicating that the weights were calibrated according to slightly different objects either in parallel or at different times. Cubo-octahedral weights of copper alloy seem to be related to the weight of the dirham, while the oblate spheroid weights are too poorly preserved for us to establish their original weight.

During the 1998–2003 campaign 378 weights were found in the settlement of Kaupang. This increases the total number of weights from the site by a factor of ten. In this paper, the heterogeneity of the weights (Fig. 6.1) has stimulated a wide-ranging discussion of the use and meaning of Viking-period weights and balances. Observed differences between the weights from graves and in the settlement at Kaupang serve as a point of departure for the presentation of the weights and balances (6.1) and leads on to a discussion of chronological change and a critical evaluation of the rigid distinction amongst weight-types seen in influential works from the last decade (6.2). This is followed by a discussion of weight-standards (6.3), what kind of activities the weights and balances were used in and the symbolic meaning connected to them (6.4).

Figure 6.1 *Weights from Kaupang. Photo, Eirik Irgens Johnsen, KHM.*

6.1 Graves and settlement – two different worlds?

Viking-period Kaupang consists of an urban settlement stretching along the shore surrounded by several large cemeteries (Pilø and Skre, this vol. Ch.2.) Weights and balances are represented both in the settlement and in some graves, but within the cemeteries they are quite a rare find (Tab. 6.1), occurring in only six burials (Blindheim et al. 1999:115–9),[1] or 3.7% of all excavated graves (Stylegar 2007). A total of ten weights and two balances has been found in four cremation graves and two inhumation graves located within three separate cemeteries (Tab. 6.1, Fig. 6.2). The single weight associated with one of the inhumation graves (Ka. 301) probably did not belong to this burial (Blindheim et al. 1995:29, 1999:117), but it is nevertheless highly likely that it was originally deposited in a nearby inhumation grave within the densely packed Bikjholberget cemetery. All the weighing equipment is from excavations organized by professional archaeologists: three finds by Nicolay Nicolaysen in 1867 and three by Charlotte Blindheim in the 1950s and in 1974.

The settlement, on the other hand, is distinguished by a large number of weights, 410 in all, and one just possible fragment of a balance (Tab. 6.2 and Appendix 1). Charlotte Blindheim's settlement excavations of 1956–1974 produced 31 identifiable weights and a fragment of a possible balance. The surveys and excavations of 1998–2003 (Pilø and Skre, this vol. Ch. 2 Fig. 2.4) yielded 378 identified weights, 280 found by metal-detector during the surface surveys and 98 during the excavations. They were found during all the different excavations of 2000–2003, the main research excavations (MRE), the Cultural Resource Management (CRM) excavation and the small-scale harbour excavation. Another weight was found when the Museum of Cultural History (KHM) undertook a minor excavation of a section with preserved Viking-period deposits in 1999 (Stene 1999).

In addition to the weights in Tables 6.1–6.2, two lead weights were found during KHM's metal-detector surveys in 2005 (Kristensen 2005),[7] close to the existing barrow cemetery at Lamøya and in an area that may have belonged to the cemetery (Fig. 6.2). However, as the surveys at Lamøya actually produced some indications of settlement, including a glass rod for bead-production, lead waste from casting, a few lead ingots and some fragments of schist, it is not possible to ascertain whether these weights originated from graves or represent settlement activity. These weights have accordingly been omitted from Tables 6.1–6.2.

Grave	Weights	Balance	Cemetery	Grave-type	Excavator	Gender	Date
Ka. 6	1	1	N. Kaupang	Barrow/cremation	Nicolaysen	Male	900–950
Ka. 8	3	1	N. Kaupang	Barrow/cremation	Nicolaysen	Male	900–950
Ka. 4	2		N. Kaupang	Barrow/cremation	Nicolaysen	Male	900–950
(Ka. 301)	1		Bikjholberget	(Flat/inhumation?)	Blindheim		
Ka. 282	2		Bikjholberget	Flat/inhumation	Blindheim	Male	900–1000
Ka. 126	1		Hagejordet	Barrow/cremation	Blindheim	Female	900–1000
Total	10	2					

Table 6.1 *Graves with weights and balances.*

Excavation and surveys	Weights	Balances
Blindheim's excavations and surveys 1956–1974	31	(1?)
Skre's surface surveys 1998–2002[2]	280	
Skre's cultural rescue management (CRM) excavation 2000–2003[3]	15	
Skre's main research excavation (MRE) 2000–2002[4]	82	
Skre's harbour excavation 2003[5]	1	
Museum of Cultural History (KHM) 1999[6]	1	
Total	410	(1?)

Table 6.2 *Weights and balances from the settlement.*

6.1.1 Types of weights at Kaupang

Even though we have to compare very different quantities, there is a striking contrast between the weights found in the settlement and those from graves at Kaupang (Fig. 6.3). While the ten weights from the graves are all made of copper alloy or a combination of copper alloy and iron, 82% of the 410 weights from the settlement are made of lead.

The graves are in fact characterized by a rather homogeneous sample of weights (Fig. 6.4, Tab. 6.3 and Appendix 2). With the possible exception of a now lost, uncertain copper-alloy weight,[8] all the weights are copper-alloy cubo-octahedral weights, or oblate spheroid weights of copper alloy and iron. The latter have an iron core surrounded by a copper-alloy mantle (Blindheim et al. 1999:115, Tab. V). Both weight-types are common in the Scandinavian Viking-period material. It is generally accepted that the types originated in the Islamic world (Steuer 1987: 460; Kruse 1992:80–1; Sperber 1996; Gustin 1999:251), but they were subsequently produced in Scandinavia, for instance at Birka (Söderberg 1996; Gustin 1997: 171) and on Gotland (Östergren 1989:171 and fig. 56). No evidence of such production has been found at Kaupang.

The settlement, unlike the graves, has a wide variety of different weight-types (Fig. 6.5, Tab. 6.4). The heterogeneous character, especially of the lead weights, gives a more differentiated picture than that described by established typologies (like Kyhlberg 1980b:219–20; Steuer 1997:44–51). The material is even more varied than expressed by Table 6.4 and Figure 6.5, as most types lack a clear delineation. Rather, the weights vary in shape so that the different types meet at the boundaries. For instance the large group of cylindrical lead weights (Fig. 6.5.c) touches the group of conical (Fig. 6.5.f) as well as the oblate spheroid lead weights (Fig. 6.5.a), while the latter also meets up with the biconical weights (Fig. 6.5.e). (For further details and definitions of the types see Appendix 1.)

The totally predominant type in the settlement is the cylindrical lead weight – amounting to nearly half

1 Birgit Heyerdahl-Larsen (in Blindheim et al. 1999:115, tab.V) presents a seventh grave (Ka. 127, KVI gr.1), but this grave is heavily disturbed (Blindheim 1974b) and the lead object is most likely not a weight.

2 C52003, C52263, C52264 and C52517.

3 C52516.

4 C52519.

5 C53160.

6 C52105.

7 C54291/1 and C54291/3.

8 Described in the Museum catalogue as "a bead of brass (with no doubt a weight)" (Blindheim et al. 1981:203) and possibly an oblate spheroid weight too.

N
Blindheim excavations 1950-57
MRE excavations 2000-2002
Blindheim excavations 1956-67, 1970, 1974
Non-excavated barrow
Excavated barrow
Cemetery
Settlement area
Area with plot-division
Weights
Weights and balances
Ka. 8
Ka. 6
Ka. 4
Bjønnes
Nordre Kaupang
Hagejordet
Ka. 126
Ka. 282
Ka. 301
Bikjholberget
Søndre Kaupang
Vikingholmen
Lamøya
0
100
200 m

Type	Copper alloy		Copper alloy/iron		Lead	Total	
Oblate spheroid	-		7	70%	-	7	70%
Cubo-octahedral	2	20%	-		-	2	20%
Uncertain	1	10%	-		-	1	10%
Total	3	30%	7	70%	-	10	100%

Table 6.3 *Weight-types from the graves at Kaupang.*

Type	Copper alloy		Copper alloy/iron		Lead		Total	
Oblate spheroid	-	-	16	4%	9	2%	25	6%
Cubo-octahedral	44	11%	1	0.2%	5	1%	50	12%
Cylindrical	2	0.5%	-	-	193	47%	195	48%
Segment-shaped	1	0.2%	-	-	33	8%	34	8%
Conical	2	0.5%	-	-	44	11%	46	11%
Rectangular prism	2	0.5%	-	-	24	6%	26	6%
Biconical	1	0.2%	-	-	18	4%	19	5%
Others	3	0.7%	-	-	12	3%	15	4%
Total	55	14%	17	4%	338	82%	410	100%

Table 6.4 *Weights from the settlement at Kaupang.*

Figure 6.2 *Overview of graves with weights and balances. The weight associated with Ka. 301 probably did not belong to this burial. Map, Julie K. Øhre Askjem and Elise Naumann.*

of the weights (Tab. 6.4). This type also illustrates the considerable variation within the types of lead weight. The diameter:height ratio varies from 1:1 to 5:9 and the weight from 1.2 g to just above 200 g. This is also the range for all lead weights that are more or less fully preserved. Even though most of the cylindrical weights are straight-sided, there is one subtype with a convex side and another with a concave side. Cubo-octahedral copper-alloy weights, segment-shaped and conical lead weights are the next largest groups. While both of these lead weight-types show great internal variation, the cubo-octahedral copper-alloy weights have a homogeneous character and are all very light. Cubic/rectangular and biconical lead weights constitute smaller groups. Especially within the biconical group a subtype with a clearly marked

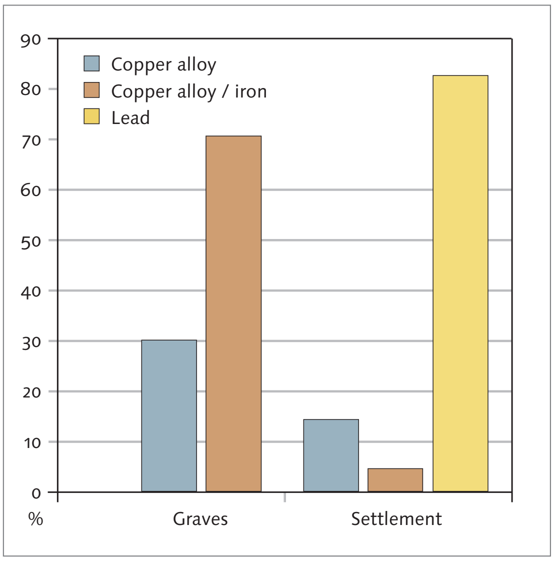
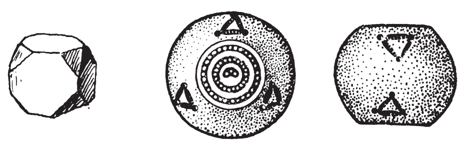


Figure 6.3 *A comparison of weights from the graves and settlement at Kaupang (N graves =10, N settlement = 410).*

Figure 6.4 *Weight-types from Kaupangs graves.* ***a.*** *Cubo-octahedral weight of copper alloy;* ***b.*** *Oblate spheroid weight of copper alloy and iron (Blindheim et al. 1981:pl. 8:7, pl. 86g). Scale 1:1.*



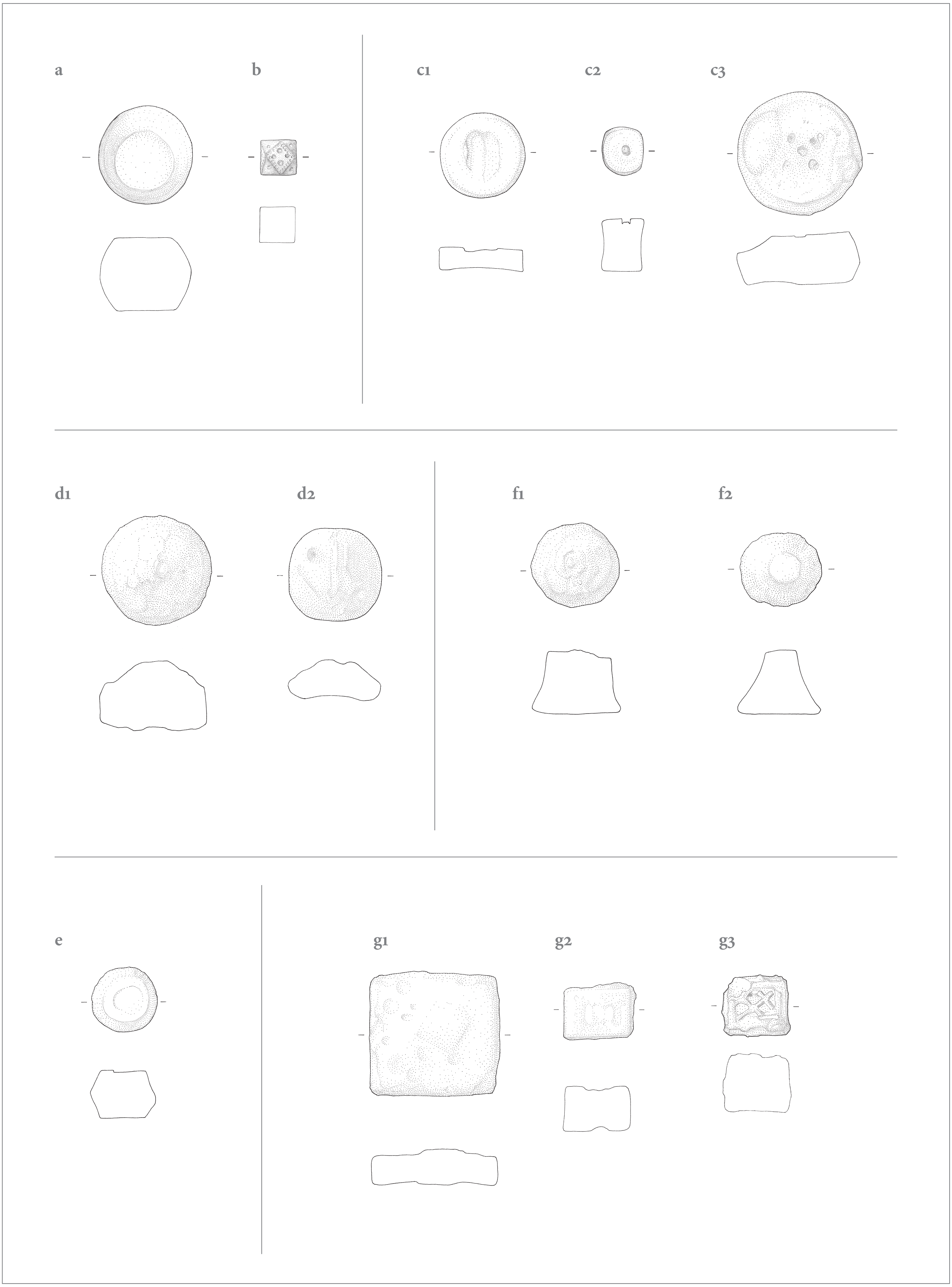

a
b
c1
c2
c3
d1
d2
f1
f2
e
g1
g2
g3

Figure 6.5 *Types of weights from the settlement of Kaupang, with subtypes.* ***a.*** *Oblate spheroid (C52519/ 14716);* ***b.*** *Cubo-octahedral (C52519/18388);* ***c.*** *Cylindrical:* ***c1.*** *straight side (C52519/15039)* ***c2.*** *concave side (C52517/617)* ***c3.*** *convex side (C52517/818);* ***d.*** *Segment-shaped:* ***d1.*** *(C52517/777)* ***d2.*** *(C52519/19669);* ***e.*** *Biconical (C52519/20041);* ***f.*** *Conical:* ***f1.*** *(C52517/675)* ***f2.*** *(C52517/645);* ***g.*** *Rectangular prism:* ***g1.*** *square, flat (C52517/766)* ***g2.*** *rectangular, high (C52517/921)* ***g3.*** *cubic (C52517/419).*
Scale 1:1. Drawings, Bjørn-Håkon Eketuft Rygh.

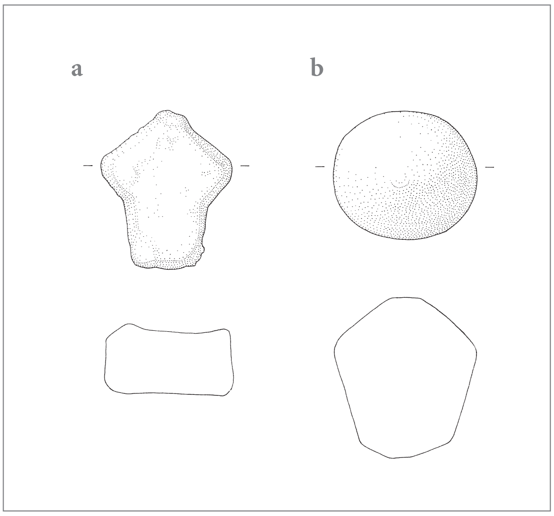


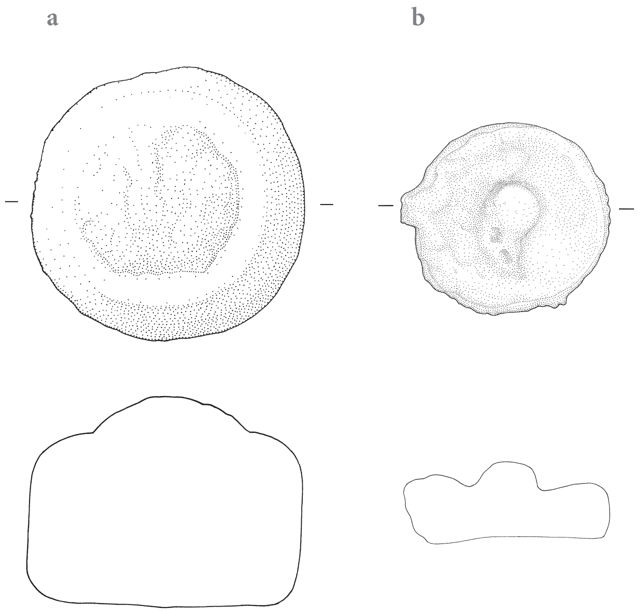
Figure 6.6 *Two possible weights from the settlement of Kaupang* ***a.*** *C52517/2076* ***b.*** *C52519/17263.*
Scale 1:1. Drawings, Bjørn-Håkon Eketuft Rygh.

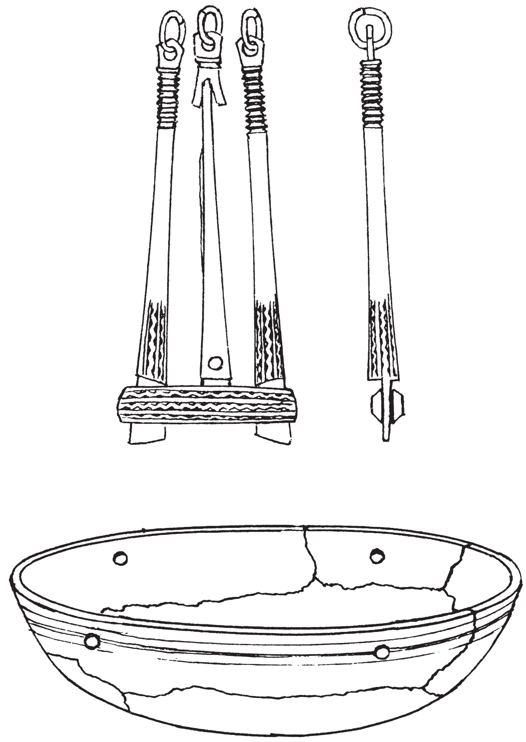
equator is very uniform in appearance, although the specimens differ in size. The majority of the lead weights are probably local products (below, 6.4.3).

In contrast to the graves, the oblate spheroid weights of copper alloy/iron constitute one of the smaller groups. There are also some marginal types and weights collected in the group “others”. The latter is a very heterogeneous group, including some elaborate weights (discussed below, 6.4.4) and several possible weights of well-defined shape but without known close parallels (Fig. 6.6). On the strength of the intentional shaping of the latter and the fact that there is no alternative interpretation for these objects, it appears most likely that they were in fact used as weights.

Eight lead weights have remains of heavily corroded iron (Fig. 6.7.a and Appendix 1). From the iron itself it is impossible to identify original form or function, although this might be the remains of a suspension loop attached to the weights (Kyhlberg 1975:fig. 4, 1980b:220). Unlike the other weights at the site, the largest weight, of 203 g, might thus have belonged to a steelyard (Jansson 1936: 18–9), a form of scales used for larger loads than the balance. Steelyards are known from other Viking-period finds such as the Mästermyr tool chest from Gotland (Arwidsson and Berg 1999 [1983]:9, pl. 2) and cylindrical steelyard-weights of lead have been identified at Birka (Kyhlberg 1975:159). Unlike the balance, each steelyard has just one weight, which is attached to the iron bar and moved laterally when weighing. Another cylindrical lead weight has a small central knob on the top that might have been used as a grip for lifting (Fig. 6.7.b).

The oblate spheroid weights of copper alloy and iron are poorly preserved. When the original surface of the coating is preserved, however, it is golden and thus most likely brass. The best preserved cubo-octahedral copper-alloy weight (Fig. 6.21.b) is character-





ized by a similar golden and shiny surface, unlike the other weights of this type. The surface of the weight was analysed using a scanning electron microscope (SEM).[9] This non-destructive analysis cannot give us the precise composition of the original alloy, but it confirms that the weight was made of brass. The surface consisted of 85–89% copper (Cu) and 10–13% zinc (Zn). A cubo-octahedral weight from the Blindheim excavations was previously analysed and it is likewise made of brass, but with some traces of lead (Pb).[10] Destructive SEM analyses of a lead weight[11] demonstrated that it is made of almost pure lead (99.1%) with small amounts of tin (0.4%), antimony (0.1%) and copper (0.4%) (Jouttijärvi 2006). Based on a visual comparison with this weight it seems highly likely that most, perhaps all, the lead weights are made of equally pure lead. This is further supported by the fact that most objects of lead from Kaupang that have been analysed by SEM are of almost pure lead (Jouttijärvi 2006).

6.1.2 Types of balance at Kaupang

Balances, on the contrary, are represented in much smaller numbers at Kaupang. While two specimens have been found in two separate graves, just one possible fragment has been found in the settlement. This is far from surprising as the loss of complete balances in a settlement area is improbable in view of their size and value. One of the balances from one of the graves is a relatively well-preserved collapsible balance of copper alloy with both beam and scale-pans (Fig. 6.8). It can be identified as Heiko Steuer's type 3 (1987:liste 6:31), characterized by its needle-shaped tongue of steel and the beam of six-sided section decorated with a wolf-tooth pattern (Steuer 1987:462; 1997:25–6, abb.4–5). A few fragments of a lock and a hinge from a special copper-alloy container for balances were found with it. The copper-alloy balance in the other grave is very badly preserved and only a few fragments of the scale-pans are present,[12] together with a few fragments of a container. It is not possible to identify this balance according to type, but the presence of the container suggests that it too was collapsible. The poorly preserved possible balance-fragment of copper alloy found in the settlement of Kaupang during the 1956–1974 surveys cannot be identified by type.

The balances from Kaupang have previously been regarded as Western imports (Blindheim et al. 1981: 177), but according to Steuer's typology the better preserved one and even the fragmented balance is more probably of an "Eastern" type. The fragments show no signs of tin coating otherwise characteristic of Steuer's type 2, the only collapsible balance-type with an assumed Western origin (Steuer 1987:462, 1997:23). Balances were probably produced in Scandinavia during the Viking Period, as demonstrated by unfinished balances at Birka (Kyhlberg 1980b:

Figure 6.7 ***a.*** *Lead weight for a steelyard (?). The iron bump on the top is probably remains of a suspension loop (C52517/ 244).* ***b.*** *Lead weight with a lead knob (C52519/ 15671). Scale 1:1. Drawings, Bjørn-Håkon Eketuft Rygh.*

Figure 6.8 *Balance from grave Ka. 6 at Nordre Kaupang, C4232b. Scale 1:1 (Blindheim et al. 1981:pl. 12:5).*

271–2) and Hedeby (Steuer 1987:462). No evidence of such production has been found at Kaupang.

6.1.3 Representativity

The total number of weights from the settlement is less certain than Table 6.2 suggests. In 32 cases, identification as a weight is uncertain due to the condition of the object, or to the hypothetical weight lacking close parallels. It is not a straightforward matter to draw a dividing line between weights and ingots, but I have treated all objects with any kind of punch-mark as weights (below, 6.3.4 and 6.4.4). In theory, anything small and heavy could be used as a weight – a fragment of an ingot or even a stone. In the graves at Birka, and in the settlement, weights are found in purses or containers together with coins and other artefacts (Kyhlberg 1980b:224–7; Rispling 2004a:30). Ola Kyhlberg (1980b:219 and 224–7) has considered both beads and brooch-knobs as weights. The use of such artefacts as weights could hardly be recognized in settlement material unless they are found in association with regular weights, for instance in a purse. Heiko Steuer (1997:12 with references) has interpreted two Roman coins found in purses as weights, and a similar interpretation of Roman coins was also proposed by A. W. Brøgger (1921:108). It is thus possible that the two Roman bronze coins from Kaupang (Blackburn, this vol. Ch. 3:Tab. 3.1) might have been used as weights as well (see also below, 6.4.1). Likewise, four deliberately cut spindle-whorls (Øye, in prep.), halved, or almost halved,[13] suggest themselves as possible weights. This seems especially likely due to the fact that a couple of weights were treated in the same way.[14] Moreover the weight of the spindle-whorls is in accordance with the weight of the weights. The spindle-whorl of 12.1 g is especially noteworthy in this respect (below, 6.3.3).These coins and the fragmented whorls are, however, excluded from the statistics, although they will be included in the discussion of spatial distribution (below, 6.4.1). Perforated cones and cylinders of lead have formerly been interpreted as weights (Kyhlberg 1973b:figs. 59a, c; Wallace 1987: 212; Kruse 1992:79), but, considered alongside the other textile-production tools at the site, perforated hemispheres, cones and cylinders of lead are more convincingly identified as spindle-whorls at Kaupang (Øye, in prep.). This is supported by the fact that no sets of weights from graves in South-Eastern Norway contain perforated lead weights (Pedersen 2000).

More consequentially, it is far from easy to draw a line between the less regular lead weights and fragments of ingots or pieces intended for leadworking. Kilograms of lead waste in the settlement of Kaupang bear witness to extensive leadworking (Pedersen, in prep.). A Viking-age grave at Sævli, Aust-Agder,[15] demonstrates that irregular pieces of lead did serve as weights. An irregular piece of lead from the grave (Fig. 6.9) had been adjusted to the same weight-standard as the more regular lead weights in the set (Brøgger 1921:4, 11). Identification of such weights from the settlement area has been impossible. The corpus of weights has thus been restricted to fairly regular types, or their miscasts, and other objects with regular shaping that most probably served as weights (see Appendix 1 for details). It should, however, be kept in mind that formal regularity was not essential for the users – although the formal regularity of many weights makes it likely that it was normal.

Different methods of artefact recovery have affected the corpus of weights. No sieving was undertaken during the 1956–1974 settlement excavation (Tollnes 1998:17), rendering it probable that some smaller weights were lost. During the MRE all the preserved deposits and even some of the plough-layer were sieved (Pilø 2007b:156–8). In addition, in the MRE

9 Analysis by Birgit Wilster Hansen, KHM, University of Oslo, report at the conservation department.

10 A63Ivt: information from the catalogue card for bronze No. 106.

11 C52519/16583.

12 C4240a.

13 C52517/490 of 22.3 g, C52517/1964 of 9.2 g, C52517/2269 of 20.1 g and C52519/15522 of 12.1 g.

14 C52517/2185, C52517/2610, C52517/2584 and C52519/15497.

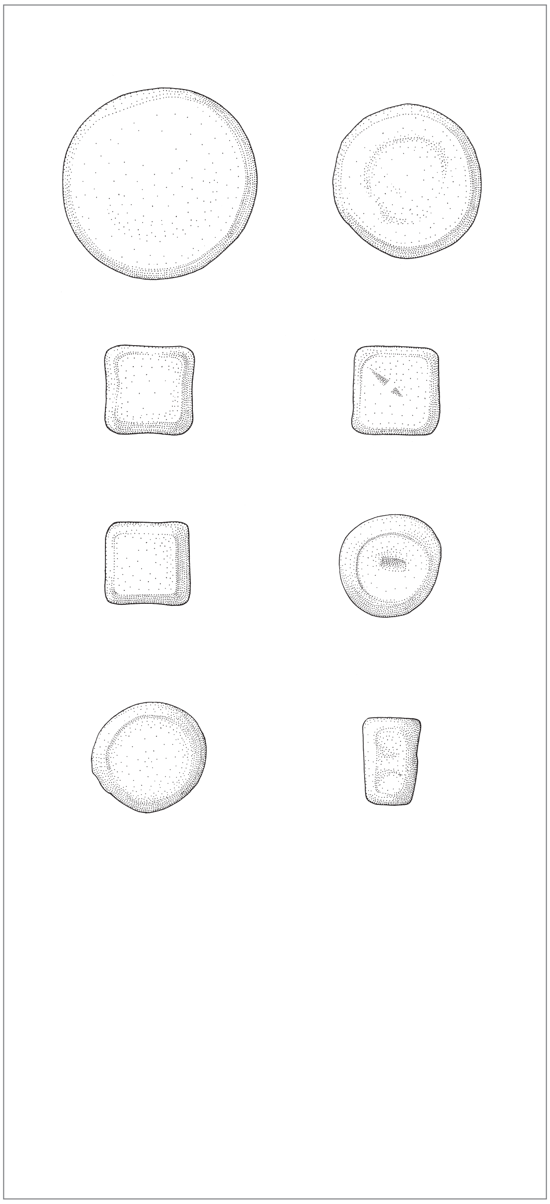


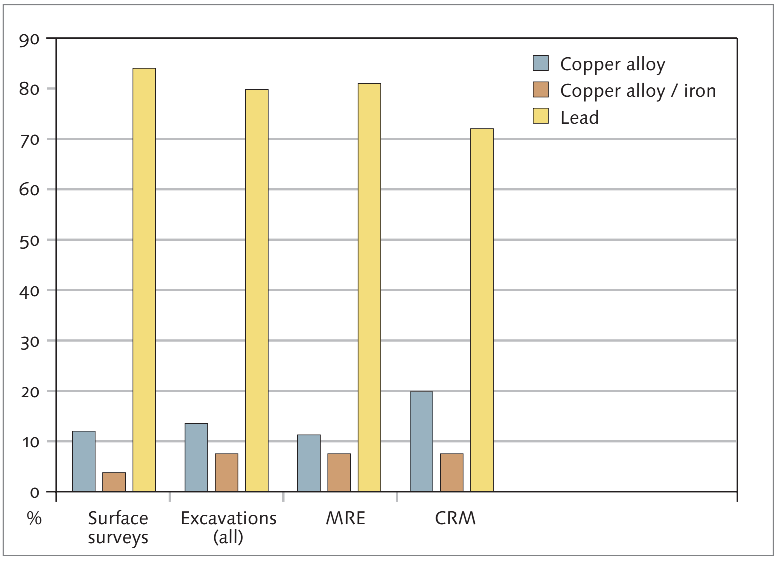
Figure 6.9 *The weight-set from Sævli. Drawing, Bjørn-Håkon Eketuft Rygh, based on Brøgger 1921:fig. 5. Scale 1:1.*

Figure 6.10 *A heavily corroded weight of copper alloy/iron (C52505/1301, max. measure 2.5 cm). Photo, Vegard Vike, KHM.*

Figure 6.11 *A comparison of the material from Skre's surveys and excavations 1998–2003. (NSurface surveys = 280, NAll excavations = 98, NMRE = 82, NCRM = 15).*

the modern ploughsoil was metal-detected during its removal in squares. Thus most of the preserved and identifiable weights from this trench are assumed to have been collected. The preserved deposits were also sieved in the course of the CRM and the harbour excavations. A comparison of the collections of weights from the MRE and the 1956– 1974 excavation shows that they are roughly equivalent in terms of both range of sizes and average weight. The larger number of weights from the MRE is thus foremost a product of the recovery of finds from the modern plough-layer. Fortynine weights of a total of 82 came from this context. Artefact recovery from the disturbed soil above the excavated area has thus contributed to the larger and even more heterogeneous find assembly. Even more radically, metal-detecting had immense impact on the recovery of weights during the 1998–2003 campaign.

The conditions for the preservation of metal, especially iron, copper alloy and silver, are far from ideal at Kaupang (Pedersen and Pilø 2007:182). Final traces of artefacts in the form of corrosion products were repeatedly observed during the 2000–2002 excavations and some of the cubo-octahedral weights were saved, fortunately due to observant staff. Copper-alloy weights, especially those with an iron core, suffer badly from the conditions. Four out of a total of six weights of copper alloy/iron from the MRE were first identified from x-radiographs. Unidentified iron from these excavations has been x-rayed, but 10% of the iron from the MRE was corroded beyond recognition. The collection of iron from the modern ploughsoil during the excavations and surface surveys was restricted to identifiable artefacts of assumed Viking-age or 11th- to 16th-century date. Although the staff were trained to identify objects such as corroded weights, it is highly likely that some were overlooked. The copper-alloy mantle is often totally corroded at Kaupang, so it is highly likely that



some weights from the modern plough-layer may have been misinterpreted as unidentifiable iron and left behind. This assumption is supported by the corpus of weights from the modern ploughsoil (Fig. 6.27). The interpretation of the signals from the metal-detector is especially difficult at Kaupang due to the ground effect.[16] All three oblate spheroid weights of copper alloy/iron from Blindheim's excavations in the settlement were identified quite recently through ongoing x-radiography[17] – illustrating how hard these are to identify visually (Fig. 6.10).

The lead weights are in general much better preserved and lead is easily detected as it yields strong metal-detector signals. It could be expected that smaller lead weights would be under-represented in the material from the surface surveys, and this is clearly the case. While the average weight from the surface surveys is of 13.3 g, the average weight from the MRE is of 9.5 g. The degree of preservation of the weights collected probably gives an indication of how the preservation conditions have biased the material. 56% of the lead weights from 2000–2003 could be regarded as fairly well preserved, as opposed to 11% of the copper-alloy weights and none of the weights with an iron core. A comparison of the weights from the excavations and the metal-detector surveys respectively (Fig. 6.11) indicates that weights of copper alloy/iron are even slightly more under-represented in the metal-detected material from the surface surveys – as expected.

With one exception, the weights from the graves are heavily corroded. Two of four oblate spheroid weights from Blindheim's excavations in the cemetery were first identified by x-ray examination (Blindheim et al. 1995:82). Equivalent x-radiography of Nicoalysen's material was conducted by Blindheim – after a century of further decay of the iron in the storage rooms, but with negative results with regards to weights (Blindheim et al. 1981:199). All in all it seems highly likely that some heavily corroded weights were lost during what was actually Nicolaysen's first large cemetery excavation, hastily conducted during one summer month of 1867 and relying heavily on local labour (Pedersen 2000:28–31). The lack of lead weights at the cemeteries is less explicable by the conditions of presevation in view of the good preservation of lead in the settlement and the fact that two fairly well-preserved lead net-sinkers have been found in inhumation graves at Bikjholberget. Lead weights placed on a cremation pyre would melt, of course, as lead melts at a temperature just above 300°C, but this does not explain the lack of lead weights in the inhumation graves. Further Viking-period cremation graves with lead weights in South-Eastern Norway,[18] and at Birka (Kyhlberg 1980b:294–305), show that weights could be kept off the pyre but added to the burial subsequently.

The conclusion must be that although conditions for preservation have clearly distorted the ratio between weights of different materials the striking difference between the graves and the settlement at Kaupang is genuine. Neither is it likely that the number of weights at the cemetery matched the amount in the settlement nor that the material and types were originally represented in equal proportions at the cemeteries and in the settlement. The absolute predominance of lead weights in the settlement is a result of unfavourable conditions for copper alloy and iron, but it seems likely that the majority of the weights were indeed of lead to begin with.

15 C8272–3. Unfortunately this piece can no longer be found.

16 Personal comment Peter Pedersen, De Bornholmske Amatørarkæologer.

17 C52505/73, C52505/1301 and C52505/1875.

18 C7838–44, C8272–3 and C30317.

6.2 A radical change from the 9th to the 10th century?

The difference between the groups of weights from the cemetery and the settlement is thus a definite one. This section will evaluate whether chronology might be an explanatory factor in this. All five Kaupang graves with a balance and/or weights are dated to the 10th century, three of them prior to AD 950 (Tab. 6.1). It is, indeed, highly likely that the two other 10th-century graves belong to the first half of the century, as the cemeteries lack later graves with just two possible exceptions (Stylegar 2007:81). Thus none of the graves with weighing equipment belongs to the first century of the town's existence. This cannot be explained by a general lack of 9th-century graves at Kaupang, as a considerable proportion of the datable graves do belong to this century (Stylegar 2007:80). However it could be a function of differences between the cemeteries. The majority of the graves with weighing equipment are situated at the cemetery of Nordre Kaupang, dominated by 10th-century graves and with fewer than 20% of the graves dated to the 9th century. Bikjholberget, with equal numbers of 9th- and 10th-century graves has only one (maybe two?) grave(s) with weights (Tab. 6.1). The internal differences do not affect the fact that no graves from the 9th century contain weighing equipment. The weights from the settlement, on the other hand, are from different chronological contexts (below, 6.2.1). In the following, the difference between the graves and the settlement will be explored.

6.2.1 The chronological distribution of weights in the settlement

Weights appear for the first time in the settlement in Site Period (SP) II, dated from c. AD 805/810 to c. AD 840/850 (Pedersen and Pilø 2007:185–6). However, no more than five weights belong to the period, all of lead. Three of the five weights are cylindrical lead weights, while one is a biconical lead weight and the other a unique conical lead weight with convex top and base (Fig. 6.6.b).

Within SP II a single weight belongs to one of the earliest layers from the site period at Plot 1A.[19] The remaining four weights all belong to SP II sub-phase 2 at Plots 3A and 3B (Fig. 6.27), dated to the second quarter of the 9th century. One of the four was found in one of the earliest layers from sub-phase 2 at Plot 3A,[20] hence a date around AD 825 could be suggested. The others belong to layers from the later part of sub-phase 2,[21] hence towards AD 840/850. However, the significance of single objects should not be exaggerated in these poorly preserved settlement deposits with the problems of identifying younger pits cutting the cultural layers and the intense bioturbation, leading to vertical transportation of small artefacts (Milek and French 2004:12–3; Pedersen and Pilø 2007:185). Nonetheless it is evident that lead weights were in use at Kaupang in the second quarter of the 9th century at the latest.

A cylindrical lead weight was found at Plot 2A in a layer, AL60592, dated to SP II sub-phase 2 (Pilø 2003:76). The dating of the layer prior to AD 840/850 could however be questioned as it contains several younger glass beads (Wiker, in prep.). The layer is described as heterogeneous and it is possible that the weight belongs to an unrecognized younger structure. Accordingly the weight will merely be regared as a possible SP II-weight in the following. In addition to these six weights – being from the MRE where the method of excavation and recording allows for a detailed dating – a weight from the CRM was found in a structure that most probably dates to SP II, based upon a comparison with the MRE. The rectangular lead weight was situated in a stone construction interpreted as a plot-division (Pilø 2007c:169, fig. 8.12)[22] and in the MRE comparably solid plot-divisions belong to SP II (Pilø 2007d:196–8).

Another two weights originally related to SP II in the MRE belong more probably to an unrecognized later feature. A cubo-octahedral copper-alloy weight (C52519/18388) and an oblate spheroid copper-alloy weight with iron core (C52519/40035) were found in AL66930, originally interpreted as a layer from SP II (Pilø 2003:40). These weight-types, however, are not known to appear this early at any other site (below, 6.2.2), and this very uncertain context cannot form the basis for a re-dating of the types. As the layer was excavated mechanically and is described as heterogeneous with great internal differences (Pilø 2003: 40–1) it is entirely possible that a later feature may have been overlooked in the area. This is supported by the fact that the layer also contained beads from the second half of the 9th century (Wiker, in prep.).

These two latter weights are consequently added to the two weights from SP III in the MRE trench. SP III comprises activity from AD 840/850 to AD 960/980 (Pedersen and Pilø 2007:186). Two weights are from the preserved deposits of SP III: the fill of a well,[23] and a small pit,[24] respectively. One is a rectangular copper-alloy weight, and the other a cylindrical lead weight that suggests lead weights remained in use after SP II, although the fill could, of course, include material of SP II redeposited. From the harbour excavation, a cubo-octahedral copper-alloy weight belongs to a preserved deposit,[25] and this weight has been used to date the layer to the later part of the 9th century and possibly into the early 10th (Pilø 2007d:200). Accordingly the layer has a date that corresponds to the preserved deposits of SP III and the weight has therefore been included in that group.

Two weights come from the fill of pits from the MRE that are no more precisely dated than SP I–III.[26] However, these weights, both oblate spheroid, point themselves towards a dating post-870/880 (below, 6.2.2), well into SP III. A rectangular copper-

SP I	SP II	SP III	SP I–III	Late-medieval plough-layer	Modern ploughsoil	Unknown	Stray finds
0	5 (7)	2 (5)	2 (5)	20 (26)	324 (330)	4	1

Table 6.5 *The distribution of the 378 weights from the Skre excavations of the stratigraphic sequences.*

alloy weight and two lead weights from the CRM trench belong to structures with an assumed date of SP I–III: a post-hole,[27] a pit,[28] and a cultural layer,[29] respectively.

The collection of weights of the preserved deposits of SP III and SP I–III thus comprises some types additional to SP II. Copper-alloy weights in the form of two rectangular and two cubo-octahedrals appear for the first time along with three oblate spheroid weights of copper alloy/iron. As demonstrated by the two weights from the reinterpreted context AL66930 there are uncertainties attached to the dating of the preserved deposits of SP III. Not all of the pits contain datable artefacts or material suitable for dendrochronological dating and later material may have sunk into some of the pits. The preserved deposits of SP III in the MRE have a suggested end-date around AD 900 (Pedersen and Pilø 2007:186), but detailed analyses of the glass beads demonstrate that SP III deposit contains types dated from AD 800 to AD 950 (Wiker, in prep.). Thus it is hard to establish whether oblate spheroid weights or the cubo-octahedral weight in the area of the MRE were lost prior to the turn of the century.

Most weights from the settlement at Kaupang are from disturbed contexts (Tab. 6.5). Of the 378 weights found during the Skre survey and excavations of 1998–2003, 20 (26) belong to the later medieval plough-layer and 324 (330) to the modern ploughsoil. This reflects the fact that 74% of the weights were found by metal-detector during the surface surveys and that the site has been heavily disturbed by ploughing in modern and later medieval times. The high amount of finds from the modern ploughsoil is also a result of the sieving of 35% of the modern ploughsoil in the MRE trench and the use of the metal-detector when it was removed (Pilø 2007b: 156–8). Although the plough-layers consist of material from the layers destroyed later (the disturbed SP III), an unknown proportion of material from SP I and II is included as well, due to the complete disruption of the Viking-period cultural layers over much of the settlement, and the redeposition of older material in the disturbed layers (Pedersen and Pilø 2007: 186).

The complete lack of weights and balances in SP I could not be explained by a general lack of weights in the region, as they appear in Scandinavia at several contemporary sites. Ribe has lead weights from the first quarter of the 8th century and throughout the preserved phases until c. AD 850 (Feveile and Jensen 2006:fig. 9.35). In Birka the first weights, of lead, appear in Phase 1, dated to the second half of the 8th century (Gustin 1998:76; 2004c:312). Thus, the occurrence of weights at Kaupang in SP II rather than SP I seems to coincide with the general change in activity in the MRE from SP I to SP II, represented by several changes in the artefactual material (Pedersen and Pilø 2007:187) together with the raising of the first permanent buildings (Pilø 2007d:195). Whether the lack of weights in SP I is characteristic for the area of the MRE in particular or the settlement in general, is an open question.

6.2.2 Dating of the weight-types

Since most of the weights from the settlement have come from the plough-layers, the dating of the types themselves are important for a better understanding of their time of use. However, most of the weight-types found in the settlement were long-lived, and only a few weights could be dated with certainty to the Viking Period alone. Three lead weights with preserved Insular mounts (below, 6.4.4: Figs. 6.33b, 6.37a and 6.42b) can most probably be dated to the 9th and 10th centuries, as weights of the same type have been found in Scandinavian graves of this date in Norway, Scotland and Ireland (Graham-Campbell 1980:307–8; Wamers 1985:catalogue 27, 38, 43, 64 and 80). It is also highly likely that a group of ten other lead weights with different types of mounts and inlays (below, 6.4.4) belong to the same period.

Otherwise, the numerous lead weights can be regarded as representatives of a long-lived (lead)

19 AL1022171.
20 AL76555.
21 AL65597, AL61041 and AL62411.
22 A3315.
23 AL22286 in A1019170.
24 AL65721 in AL25261.
25 AL4453.
26 AL43104 in A1035711 and AL41983 in A40814.
27 A3549.
28 A11958.
29 AL4360.

weight-tradition. Weights of lead were in use into the 14th century (Færden 1990:241; Steuer 1997:460) and the cylindrical examples have parallels back in the Migration Period, as in a mid-6th-century grave from Snartemo, Vest-Agder (Hougen 1935:14 and 34),[30] and a 6th-century grave from Holte, Rogaland.[31] Correspondingly, cylindrical copper-alloy weights have parallels in Norwegian graves dating from the Roman Iron Age (Blindheim 1974a:73),[32] Migration Period (Magnus 1978:166–79),[33] and Merovingian Period (Kilger, this vol. Ch. 8:283).[34] A few similar weights occur in graves at Viking-period Birka (Kyhlberg 1980b:298–305) and in post-Viking Oslo (Færden 1990:241). One weight of this type found in a grave at Auby, Tjølling, 8 km north of Kaupang, even demonstrates the nearby use of cylindrical copper-alloy weights back in the Roman Iron Age.

A considerable proportion of the weights might thus, in theory, be older or younger than the Viking-period, but none are of types that can definitely *not* have been in use in the Viking Period. The assembly itself – characterized by many different weight-types –nevertheless points towards a Viking-period date. All well-preserved lead and copper-alloy weights found in Norway in the preceding periods are cylindrical, while lead weights of different shapes are found in Norwegian Viking-period graves (Pedersen, U. 2001:fig. 4). Likewise the settlement of Helgö with weights from the Migration Period to the beginning of the Viking Age is dominated by the cylindrical type (Kyhlberg 1980b:181), while the assemblage at the Viking-period settlement of Birka (Gustin 2004a: table 1) is as varied as that from Kaupang. Unlike the Kaupang weights, the majority of the weights from Birka have been found in definitely Viking-period deposits. Moreover the very restricted quantity of copper-alloy weights of types other than the oblate spheroid and cubo-octahedral also seems to point towards a Viking-period date – or at least no earlier. In groups of weights pre-dating the Viking Period, such as from the Norwegian graves,[35] or at Helgö (Kyhlberg 1980b:181 and 291–3), copper-alloy weights are much more frequent. Moreover, most datable artefacts from the 1998–2003 campaign belong to the 9th and 10th centuries (Pilø 2007c:177–8). Only a handful of pre-Viking-period finds of other types have been found in the settlement area and the restricted later medieval find material reflects a rural settlement where weights should not be expected. It is altogether most likely that all the weights are related to Viking-period activity at the site.

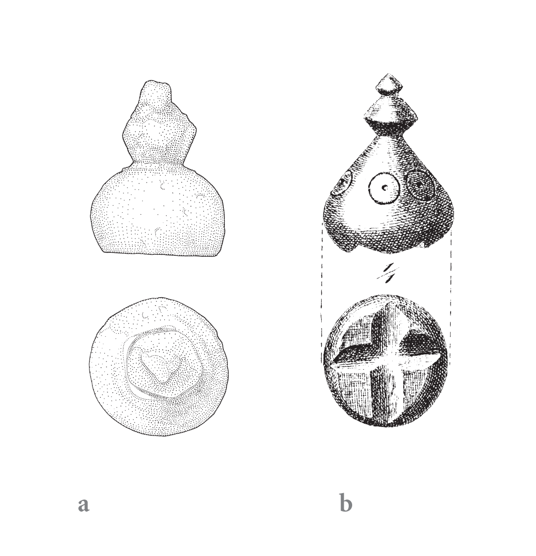
Due to the high proportion of undatable weight-types at Kaupang, it is impossible to ascertain over what period weights were lost in the settlement area, or whether they were actually lost continuously. At least we know that a minimum of 18% of the material reflects considerably later use than SP II. Fifty cubo-octahedral weights must have been lost or deposited after AD 860/870 and the 25 oblate spheroid weights after AD 870/880. According to Heiko Steuer (1987: 460; 1997:12), cubo-octahedral and oblate spheroid weights appear from AD 870/880 in all the lands around the Baltic, but the excavations in the settlement of Birka of 1990–1995 have demonstrated that cubo-octahedral weights were already in use around 860/870, while the oblate spheroid weights appear in the next phase (Gustin 2004c:314). Only B1alt, a subtype of the oblate spheroid weights, is restricted to the Viking Period. All other subtypes continue into the 11th and 12th centuries (Steuer 1997:abb. 232). Due to the poor conditions for preservation, the identification of subtypes has not been possible at Kaupang. It is not impossible, therefore, that some were lost after the urban settlement was abandoned, but this seems most unlikely. With their presence in local graves in mind, it seems reasonable to postulate the use of cubo-octahedral and oblate spheroid weights in the settlement area at least into the first half of the 10th century.

Compared with Norwegian grave-finds, it is striking that no massive oblate spheroid weight of copper alloy has been found in the settlement. This type is quite common amongst grave-finds, but foremost in graves from the 11th century. According to Steuer (1997:47 and abb. 232) none of the earliest oblate spheroid copper-alloy weights (B1alt) are massive. Such weights are first represented with the later subtypes appearing from the last decades of the 10th century onwards. The lack of these subtypes could, then, suggest that few weights were in use towards the end of the 10th century. One weight might belong to the last years of activity in the urban settlement, during the later part of the 10th century. The pear-shaped weight of copper alloy (Fig. 6.12.a) has similarities to a copper-alloy weight from Saude, Telemark (Fig. 6.12.b) found with a balance dated to c. AD 980–1320 (Steuer 1997:358 and abb. 165). Similar weights are also found in Norwegian medieval towns (Grieg 1933:fig. 324; Færden 1990:fig. 25).

6.2.3 A chronological change?

The fact that all five (seven) weights from SP II are of lead could suggest that all early 9th-century weights at Kaupang were made of this metal, although no firm conclusion can be drawn from the limited quantity of evidence. It does seem highly likely that some other lead weights from disturbed contexts originally belonged to the 9th century. 9th-century use of lead weights in the settlement is not reflected in the cemeteries. Due to the destruction of most preserved layers post-dating AD 840/850, the settlement finds cannot shed light on the use of weights in the 10th century. Accordingly, the copper-alloy/iron weights in the graves could either be the only weight-types in use at

Figure 6.12 ***a.*** *A pear-shaped copper-alloy weight C52517/2274. Drawing, Bjørn-Håkon Eketuft Rygh.* ***b.*** *Weight from Saude, Telemark, C9204 (Ab 1879:fig. 57). Scale 1:1.*



these later dates, or they could be a selective sample from a wider range consisting of both lead and copper-alloy weights. The large quantity of lead weights in the disturbed settlement deposits seems to favour the latter hypothesis. Seen in relation to the limited amount of weights from the preserved deposits of SP I–III it seems most likely that lead weights continued to be lost after AD 850 and cover a considerable time-span, probably well into the 10th century – although it is doubtful that they were lost at the same rate all the time and everywhere (see below). Later use of lead weights is supported by the existence of a few cubo-octahedral and oblate spheroid weights of lead in the settlement. These certainly indicate the parallel use of weights of lead and copper alloy or copper alloy/iron at some point after AD 860/870 or AD 870/880. To shed more light on the relationship between the 9th and the 10th centuries in the use of weights, material from the rest of Scandinavia will be drawn into the discussion that follows.

Substantial finds of weights seem to be characteristic of Scandinavian Viking-period urban sites such as Birka, Hedeby and Dublin (Steuer 1987:473; Wallace 1987:212–5; Gustin 2004a). Like Kaupang, Birka is characterized by a settlement with surrounding cemeteries, and weights and balances are found in both contexts. As the sites are broadly contemporary, they are suitable for comparison. Birka was established in the second half of the 8th century and continued to c. AD 970 (Clarke and Ambrosiani 1995:75). A superficial comparison of the Kaupang material and weights from the graves and the settlement excavation at Birka 1990–1995 (inspired by Gustin 2004c: figs. 5.5–5.6) demonstrates that the differences observed at Kaupang have counterparts at Birka (Fig. 6.13). At Birka too, the settlement is dominated by lead weights and the graves by copper-alloy weights, some of them with an iron core. Accordingly, the difference between the graves and settlement is not a peculiarity of Kaupang, but typical of both these contemporary urban sites in Scandinavia. At Birka the observed differences are furthermore based on a statistically significant find-assemblage.

At Birka, too, the deposition of weights in the graves starts considerably later than the use of weights in the settlement. In the settlement weights are found from the outset, in the second half of the 8th century, and in all subsequent phases (Gustin 2004c:94), while no weights were deposited in graves in the earliest period at Birka (Kyhlberg 1980a:69 and 79). Using seriation, Kyhlberg argues that deposition of weights in graves was a custom that was taken up no earlier than the middle of the 9th century and which increased steadily from then onwards. The fact that 80% of the weights from graves are of types dated post-AD 860/880 (Kyhlberg 1980b:219) strengthens his interpretation. A change in the burial practice at urban sites some time in the late 9th century thus seems to explain the lack of 9th-century graves with weights at Kaupang. The relevant graves at Birka are distinguished from those at Kaupang by being more numerous: 148 burials (Kyhlberg 1980b: 201), i.e. 13% of the excavated graves (Clarke and Ambrosiani 1995: 74) contain weighing equipment, in contrast to 4% at Kaupang (above, 6.1). The occurrence of balances, however, is even lower, found in no more than four graves (0.3%), and thus even less frequent than at Kaupang (1.2%).

The material from the excavations in the settlement of Birka 1990–1995 could contribute to a much

30 C26001.

31 St4547.

32 C13202 Auby, Tjølling, Vestfold.

33 B4590 Evebø, Gloppen, Nordfjord.

34 C525 Bråten, Norderhov, Ringerike.

35 Based on notes 30–4 and C340 and B4842.

better understanding of the use of weights and balances in a settlement in the late 9th and 10th centuries, but it is not yet published with detailed contextual information. It is clear, as at Kaupang, that lead weights are predominant in the earliest phases, but it is also obvious that copper-alloy and copper-alloy/iron weights predominate in the latest phases (Gustin 2004c:94). At Birka, the earliest copper-alloy weights appear around AD 860/70 (Gustin 2004c: 312–4) and after their appearance only a few lead weights are found in the following phases (pers. comm., Björn Ambrosiani and Ingrid Gustin). Moreover the Birka material demonstrates that a large number of weights were lost in a limited area over a short period of time. All the weights from the 1990–1995 excavations are from a trench of about 350 sq m and most of the 199 lead weights belong to a period of approximately 50 years (pers. comm., Björn Ambrosiani and Ingrid Gustin). The Birka material thus contrasts with the material from Kaupang, where no more than five (seven) weights were found in the deposits of SP I and SP II that should cover roughly the same period of time. Thus the loss rate of weights at the two sites is strikingly different (this will be returned to below, in 6.4.1 and 6.4.3).

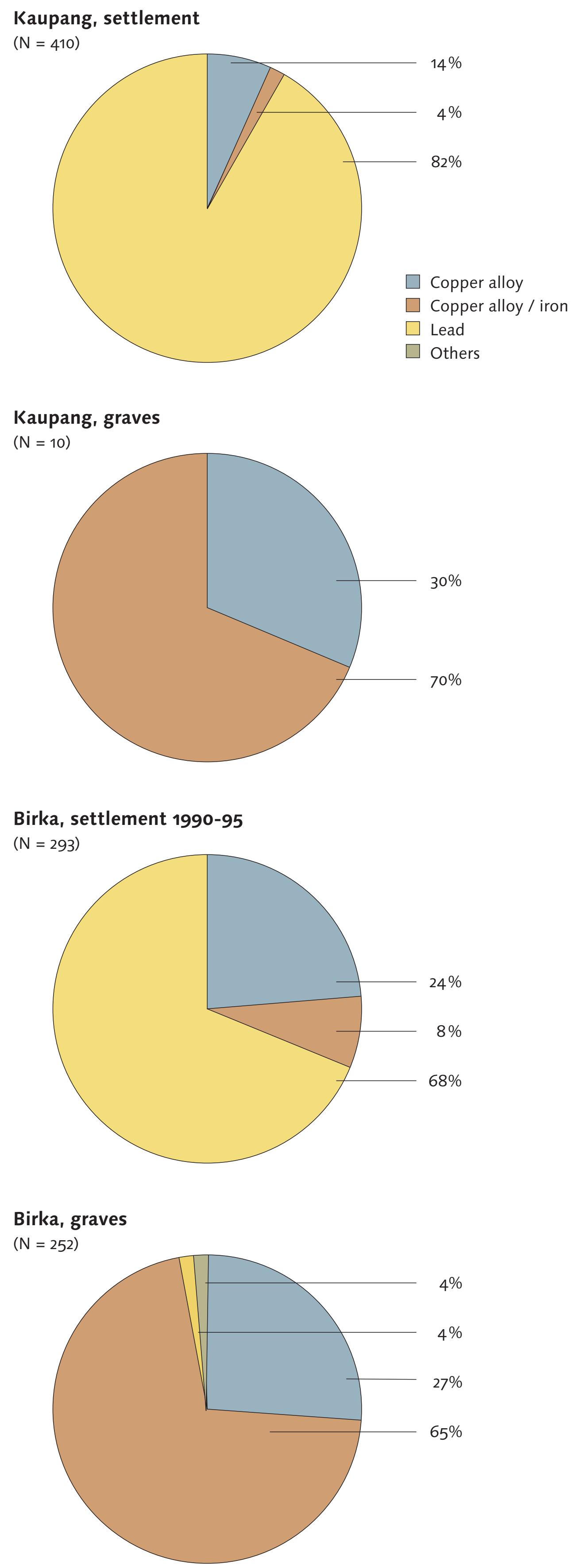
At Birka the change in weight-types is contemporary with a radical change in the activities at the excavated plot – with the cessation of the bronzecaster's workshop (Gustin 2004c:94). The large amount of lead weights is closely related to workshop activity (below, 6.4.3). It is thus possible that excavations at other plots at Birka or of other 10th-century deposits might reveal that the radical reduction of the lead weights primarily reflects a change in activity. Another find from Birka shows that weights made of lead and copper alloy were used together into the middle of the 10th century. A collection of weights, coins, beads and jewellery interpreted as the contents of a purse includes four oblate spheroid weights of copper alloy/iron and two lead weights (Gustin 1999: 248, 2004c:94). Based on the t.p.q. of AD 938–9, this find is dated to around AD 950 (Rispling 2004a:30).

Unfortunately no other Viking-period settlement material from the area of what is now Norway can shed light on the use of weights. The collection from the settlement at Kaupang is truly outstanding in the Norwegian archaeological record. None of the c. 200 Viking-period weights outside Kaupang is securely associated with a settlement, with the exception of a possible Viking-period lead weight in a rock shelter at Fana, Hordaland,[36] and four weights of a possible Viking-period date at the chieftain's farm at Huseby,[37] about 1 km from Kaupang (Appendix 1). Like Kaupang, the hall at Huseby belongs to the Skiringssal complex (Skre 2007e). Unlike the settlement area of Kaupang, the excavation at Huseby produced considerable amounts of artefacts from the Early Iron Age and the Middle Ages in addition to the Viking-period material. It is an open question whether the weights there reflect Viking-period activity. They resemble the Kaupang weights, and were accompanied by fragments of silver dated to the Viking Period (Skre 2007e:240–2), but all four coins from Huseby belong to the 11th–16th centuries (Blackburn, this vol. Ch. 3:68). It is thus equally likely that the weights were used in connexion with the handling of silver in the medieval *stofa* built at the same place in the 11th century.

The lack of settlement parallels might reflect the fact that few Viking-period settlement sites have been identified and excavated in Norway. Evaluated against the Danish material it seems highly likely that more settlement sites with weights will be located in the future. In Denmark, Viking-period settlement sites at different economical and political levels with varying amounts of weights are found through metal-detector surveys and large-scale settlement excavations (Henriksen 2000; Watt 2000; Jørgensen 2003; Ulriksen 2004:fig. 4). About twenty weights found by metal-detector at different places in South-Eastern Norway during the last few years might represent further settlement sites, but the weights have as yet been found in such small numbers at each site that they could just as well have originated from ploughed-out graves. The majority of the weights are also of types of a wide chronological distribution, from the Migration Period to the post-Viking Period: it is therefore uncertain that they are of the Viking Period. Nevertheless excavated Viking-period building sites without weights, such as the chieftain's farm at Borg in Lofoten (Munch et al. 2003), seem to show that weights are not present in the finds at all contemporary settlements, not even the most prestigious ones. Seen in the light of the large body of material representing craft and exchange at Kaupang, it seems likely that the high number of weights in the settlement area reflects the extensive production and exchange activities here, which may be unparalleled elsewhere in Early Viking-period Norway.

The graves at Kaupang, on the other hand, can be assessed in light of a series of graves. In Norway, Viking-period weights and balances occur in some 130 finds outside Kaupang, of which around a hundred are identified as graves.[38] As at Kaupang, the majority of the grave finds with weighing equipment in South-Eastern Norway are concentrated in small clusters (Fig. 6.14). Fjære and Valle in Aust-Agder, Tune in Østfold, Løten/Hamar/Stange in Hedmark and Hedrum/Larvik in Vestfold appear as areas with a concentration of graves with weights and/or balances (Pedersen, U. 2001:28–9). As a result, the concentration of graves with weights at Kaupang does not stand out as unique, but seems to reflect a tendency in South-Eastern Norway for graves with weights to occur in clusters. There are, in fact, even more graves containing weighing equipment at near-

Figure 6.13 *A comparison of weights from Kaupang and Birka (after Kyhlberg 1980b:219 and 298–305; Gustin 2004a:table 1).*



by Hedrum by the River Lågen than at Kaupang. As all datable graves in Hedrum/Larvik are dated to the same period of time as Kaupang (Pedersen, U.2001: 29), it seems quite possible that they were influenced by the activity there. As at Kaupang, the areas of these grave-clusters are characterized by imported finds and other indications of trade and accumulation of wealth (Brøgger 1922; Martens 1969; Larsen 1980, 1986). In most places the graves can be dated within a limited period of time. Thus these graves from South-Eastern Norway with weighing equipment could contribute to the understanding of the Kaupang graves and will be drawn into the debate on the use of the equipment in the following sections.

At first sight, the deposition of weights in the graves of South-Eastern Norway seems to differ radically from the deposition of weights in the graves at Kaupang. Of the 101 weights from the graves, 36% (36) are lead (Fig. 6.15). However, the 30 graves with these 101 weights represent a much longer period of time, from the 9th century to the late 11th, and there are notable differences between the graves that can be dated to the earlier and later parts of the Viking Period respectively (Appendix 4). Ten graves are certainly later than c. AD 950 and these contain 46 weights of which only 1 (2%) is made of lead. In contrast, the nine graves that are certainly older than c. 950 have a total of 25 weights, of which 16 (64%) are of lead. Thus these graves also seem to suggest that lead weights were predominant in the Early Viking Period but were totally outnumbered by copper-alloy and copper-alloy/iron weights by the end of the

36 B11109.

37 C52518.

38 Based on Pedersen 2000, Jondell 1974, and additional data from http://www.arkeoland.uib.no/losemFS. htm, searched several occasions up to 31.12.06.

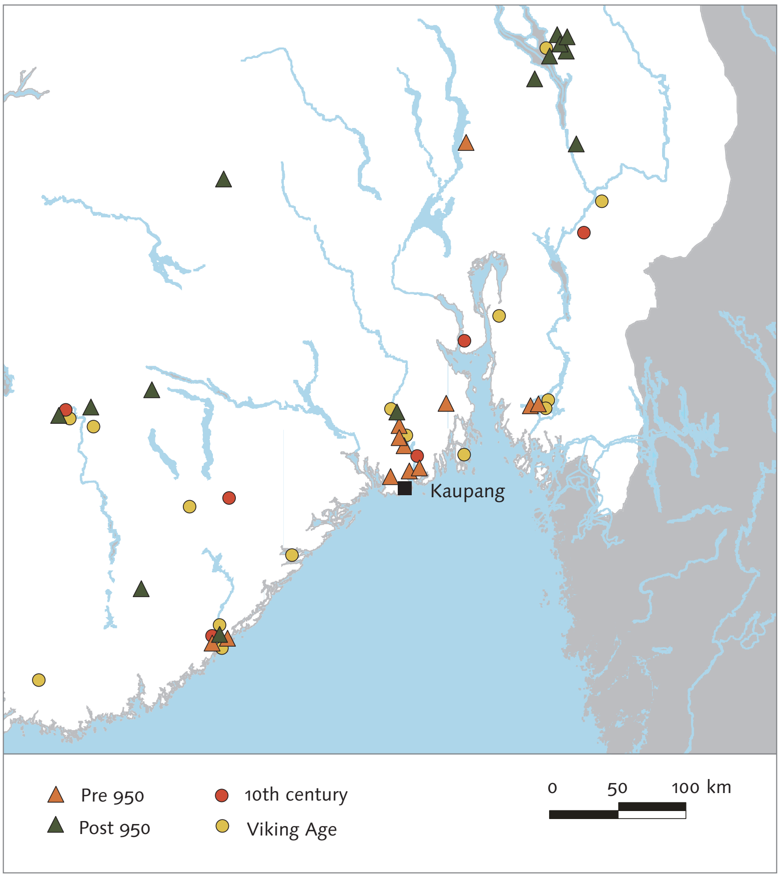


Figure 6.14 *Graves from South-Eastern Norway with weights and/or balances. Map, Elise Naumann and Unn Pedersen.*

Figure 6.15 *The material of the weights from graves in South-Eastern Norway, mixed graves excluded.* (N*all* = 101, N<*950* = 25, N>*950* = 46).

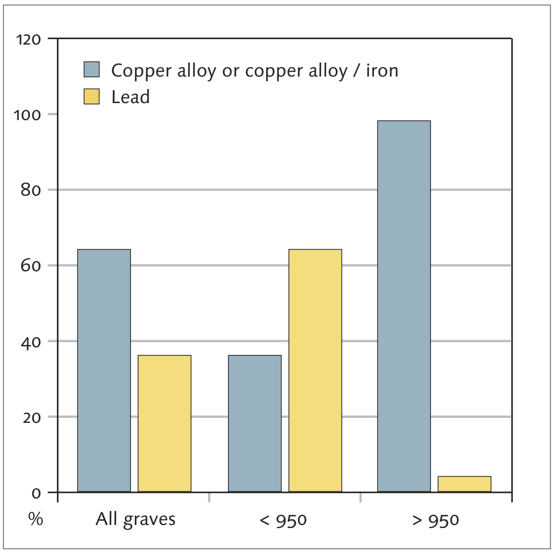
period. As at Kaupang, no grave can certainly be dated to the 9th century, but one dated c. AD 850–950 might belong there. Due to the restricted number of graves and the relatively imprecise dating of most of them, the precise date of this change is hard to pinpoint. It is nevertheless possible that one grave dated to c. AD 900 gives some indication of the time of change, with its three lead weights and nine copper-alloy and copper-alloy/iron weights.

Two of the graves dated 900–950 with a total of four lead weights support the inference that lead weights were still used in the settlement of Kaupang in the 10th century. These two graves are likewise both from Vestfold. The pre-950 graves also indicate that the deposition of weights in graves at Kaupang differs significantly from the deposition of weights in graves in the surrounding area. As we have seen, several graves contain lead weights and three of these graves are located in the immediate vicinity of Kaupang, one in Larvik,[39] and two at Hedrum,[40] 7, 5 and 22 km from Kaupang respectively. Although the cemeteries at Kaupang are at the place where lead weights were unquestionably in use, it is in the hinterland that the use of these weights is witnessed in the graves.

To sum up, Kaupang clearly illustrates that graves do not mirror life. Nevertheless some similarities between Kaupang, Birka and the graves with weights from South-Eastern Norway are striking. They all point to a predominance of lead weights in the 9th century changing to copper-alloy weights from the latter part of the 9th century and into the 10th. However, later use of lead weights is well attested in 10th- and 11th-century Dublin (Wallace 1987:212) and remains an element in Scandinavian medieval towns such as Oslo and Lund. In Oslo this element is rather modest (Færden 1990:239) but lead weights have been documented into the 12th century in Lund (Molander 1976:193). It is difficult to reach definite chronological conclusions, but the evidence currently available seems to suggest that there was a shift in dominance from lead weights in the Early Viking Period to one of copper-alloy or copper-alloy/iron weights in the later Viking Period. What is demonstrated beyond doubt is that the grave-finds from the two urban sites Kaupang and Birka do not reflect the actual use of weights there in the early 9th century.

6.2.4 Two different groups of weights?

In the graves and the settlement at Kaupang nearly all the copper-alloy weights are cubo-octahedral while nearly all the copper-alloy/iron weights are oblate spheroid (Tabs. 6.3–6.4). The same is the case at Birka (Kyhlberg 1980b:298–305; Gustin 2004a:tab. 1) and in the graves of South-Eastern Norway (Pedersen 2000:fig. 4.3). As these two types were introduced in the second half of the 9th century (above, 6.2.2) the observed shift from lead to copper-alloy weights seems to be closely related to the appearance of these new forms. Steuer (1987:460; 1997:44–5; 2002) has repeatedly emphasised the difference between lead weights on the one hand and these two types on the other. He regards the former as a diverse group, opposed to what he calls "regulated" *(genormt)* weights. His distinction has had great influence in weight studies in recent decades, especially Ingrid Gustin's (2004c) discussion of the Swedish material. In Steuer's and Gustin's research the regulated



weights received far more attention than the lead weights. Due to their high proportion amongst the weights from the settlement of Kaupang the lead weights will be the main focus of discussion in the next section, analysed along with all other types of weights. This could contribute to a better understanding of the use of weights prior to the introduction of the regulated weights and provide us with a more nuanced picture of the use of weights and balances in the period following their introduction.

There are undoubtedly differences between the two groups. As Steuer (1987:467) has pinpointed, the production of the so-called regulated weights is technically much more advanced than that of lead weights. The copper-alloy mantle and the decoration of the regulated weights make adjustments impossible, in contrast to the soft lead weights which could easily be adjusted using a knife. The material from Kaupang and Birka has also demonstrated that the two types have different chronological ranges, and that the people there saw little or no reason to include the lead types in the graves (Fig. 6.13).

Nevertheless, there is a fusion of the two groups of weights at Kaupang (Fig. 6.16) represented by lead weights of cubo-octahedral or oblate spheroid shape. As the oblate spheroid weights are quite similar to the cylindrical lead weights with convex sides the latter type might be questioned; the cubo-octahedral lead weights on the other hand have a distinct shape and are unquestionably copies of the copper-alloy ones. Both types of lead weight are represented in the settlement of Kaupang. Even though oblate spheroid lead weights are known from Birka (Gustin 2004a: tab. 1), Paviken at Gotland (Lundström 1981:111), and Uppåkra in Lund (Gustin 1999:260–1), these weight-types have had little attention so far. I find it reasonable to regard these weights as a part of the heterogeneous (lead) weight-tradition deriving from the Iron Age. As we have seen, this tradition becomes characterized by a wide variety of different shapes during the Viking-period (above, 6.2.2). It is noteworthy that it was the shapes of the new types that were copied, not details like the decoration otherwise characteristic of these types of weights. There must have been no intention to match the regulated weights by weight in the medium of the much heavier lead. Thus these weights seem to suggest that the shapes introduced with the new, regulated weights were incorporated into the traditional use of weights in Scandinavia. Gustin (1997:171) has drawn our attention to the fact that the oblate spheroid weights are made either of copper alloy alone or with a copper-alloy mantle around an iron core (se also Steuer 1997:33 and 285–6), and that both types were produced at Birka. The copper-alloy/iron weights were protected against change, as Steuer has claimed, while the properties of the massive copper-alloy weights are identical to other types of massive copper-alloy weight and more similar to the lead weights than to the remaining weights with a mantle. Steuer (1997:33 and 312–5) has himself noted that some of the massive oblate spheroid weights were apparently manipulated to change their weight. Accordingly, even these oblate spheroid weights seem more closely related to the local weight-tradition.

Some grave-finds could even suggest that the regulated weights themselves were to some extent incorporated in the Scandinavian weight-tradition. Weights from the two groups are not mutually exclusive in the graves: lead weights and regulated weights appear together in some cases. Amongst the eleven graves of South-Eastern Norway with lead weights and more than one weight, three contained regulated weights too. The same phenomenon is also observed

39 C11790–4.

40 C14139–44 and C12480–3.

in the few graves in Birka with lead weights, as all four graves with more than one lead weight contained regulated weights as well (based on Kyhlberg 1980b: 298–305). As discussed above, even the purse from the settlement of Birka contained both groups of weights (above, 6.2.3). According to Steuer (1987: 459–62), the first collapsible balance (type 3) was introduced along with the regulated weights. The three finds from South-Eastern Norway with this balance-type, however, have weights representing all possible combinations: lead weights alone, regulated weights alone, and a combination of the two. The grave with regulated weights alone is that at Kaupang. Steuer's (1987:462) type-2 balance, considered to be the Western response to the introduction of type 3, is found in three graves in South-Eastern Norway: two with lead weights, the third with a combination of regulated and lead weights (Appendix 4). The use of different types of weight and of balances seems more pragmatic than regulated. In the following section, the use of all types of weight will be discussed comparatively, to evaluate similarities and differences.

6.3 Weight-standard

Calculation of weight-standards, using more or less sophisticated statistical analyses, has been one of the main projects in research on Viking-period weights and balances. Several studies have concluded that Viking-period weights and balances were functional tools of quite high accuracy and usefulness (Brøgger 1921; Steinnes 1927; Kyhlberg 1980b; Steuer 1987; Sperber 1996; Steuer 1997). Although this equipment could be used in a less sophisticated manner, by simply weighing out an amount equal to one's weight(s), carefully composed sets of weights from Viking-period graves and hoards reveal a sophisticated use of weights which presupposes specialized knowledge. The method of subtraction – to put weight(s) together with the weighed object(s) and then subtract that weight from the total in the other scale – was used besides that of addition (Steinnes 1927; Kyhlberg 1980b:150). This section will address the possibility of identifying what standards the weights at Kaupang were calibrated according to, and whether the punched-dot decoration seen on a large number of the weights is related to identifiable standards. The modern metric gram is used in the following when referring to Viking-period weighing in general and the Kaupang weights in particular. This weight in grams was of course irrelevant to the Viking-period user of weights and balances, but it is a useful tool for our understanding of standards, weight-units and accuracy.

6.3.1 Accuracy

The accuracy of the balance is the decisive factor in the accuracy that could be achieved when weighing (Kyhlberg 1980b:150; Sperber 1996:18–25; Steuer 1997:112–22). The accuracy of the balance also governs the production of new weights. The balance's sensitivity, or response to changes of equilibrium, determines whether differences between two roughly equal weights can be registered when each is put in one scale-pan. Erik Sperber (1996:fig. 5.1, 18–25 and 115–7) tested three well-preserved Viking-period balances experimentally and combined his observations with an advanced equation based on the properties of

Figure 6.16 *Cubo-octahedral weights and an oblate spheroid weight of lead (A63cc (d=1.7 cm), C52517/383 (0.9 x 0.9 x 0.8 cm), C52517/2034 (d=1.9 cm), C52517/2392 (1.2 x 1.1 x 1.2 cm). Photo, Eirik Irgens Johnsen, KHM.*

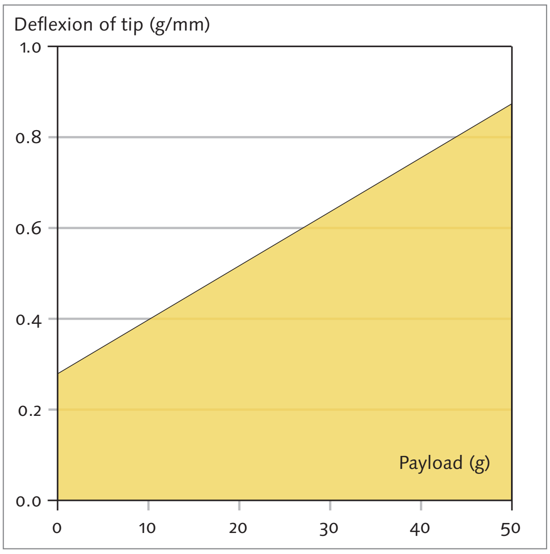


Figure 6.17 *Result of experimental testing of Viking-period weights and balances. The weight needed for deflecting the tip one millimetre increases with increasing payload (after Sperber 1996:fig. 3.5).*

the balance-type. Assuming that the user could observe a 1 mm deflection of the tip of the pointer, Sperber claims that the addition of 0.2–0.4 g in one scale could be noted by the user when both scales were without any other load, while an addition of 0.6–1.0 g or more was necessary at a load of 50 g (Fig. 6.17). Sensitivity is thus reduced at heavier loads. These results are roughly in accordance with the smallest preserved weights from the Viking Period, of 0.2–0.3 g (Steuer 1997:116).

Sperber's study is subject to some uncertainty as two of the balances from these experiments are rather poorly preserved and have been repaired in modern times. Both Sperber himself and Steuer have argued that even greater accuracy could have been achieved. The use of Viking-period weights and balances was dependent upon the competence of the users, and their ability to observe changes of equilibrium. An experienced person could achieve greatest accuracy using a familiar balance and could probably correct for problems, for instance caused by wear (Kyhlberg 1980b:150; Sperber 1996:24–5). Sperber (1996:24) suggests that a competent user could observe a 0.3 mm deflection of the tip, while Steuer (1997:116–8) stresses that there are considerable differences between different types of balance in the Viking-period material with regards to their accuracy. The longer and lighter the beam and the pointer, and the lighter the scale-pans and strings or chains suspending them, the greater the accuracy (Steuer 1997:119). According to Steuer (1987:462–3), his type-3 balance was the most accurate one in use in the Viking Period. He has suggested that 3 g was the minimum load that could be weighed on this balance within an accuracy of 1%, while a load of 4.25 g could be weighed within an accuracy of 0.7%, hence giving a range of 4.22–4.28 g (Steuer 1987:463). Two of the balances tested by Sperber are of Steuer's (1997:463 and abb. 9) type 7 from the late Viking-period – a much less accurate type. In sum, Sperber's and Steuers observations demonstrate that the accuracy of the Viking-period balances is high, but that minor differences registered by modern equipment would not be noticed.

Due to their different properties the balance types also have different capacities. According to Steuer (1987:note 203) the ideal maximum capacity of the type-3 balance is around 10–20 g while the 11th- to 14th-century balances of his types 7 and 8, with beam lengths of 175 and 215 mm respectively, would have ideal maximum capacities of 100 and 200 g respectively (Steuer 1997:323). Comparing sets of weights and balances in graves and hoards there is a clear tendency to conform to the capacity of the balance (Steuer 1997:abb. 235). Some finds, however, such as the Sævli grave (Brøgger 1921:4), seem nevertheless to imply that its balance of type 3 was used for much heavier loads. Its weight of c. 53 g, for instance, is more than 2½ times the calculated capacity.

In the 10th century, highly accurate balances were available at Kaupang. The balance identified in a grave is the most accurate example, a Steuer type 3 (above, 6.1.2). As no balances from the 9th century have been found at the site, the accuracy of the balances in use at that time is uncertain, but according to Steuer (1997:abb. 165) the only type of Viking-period balance in use before the end of the 9th century was his type 1, a non-collapsible balance. This balance is about half as accurate as type 3 (Steuer 1987:463). Change due to corrosion and secondary damage is another important factor when evaluating the weights in what follows. Although some are much better preserved than others they have all been affected by the fact that they have spent a thousand years in the ground. All the lead weights, for instance, are covered with an oxide layer of unknown thickness. But unless these weights are damaged by a network of cracks they have proved to be useful in metrological studies (Sperber 2004:63 and 72). When the term "well-preserved" is used, it is thus as a relative term – used for weights without other signs of damage than a slightly corroded surface.

The graves from Kaupang and the rest of Norway reflect the very careful handling of weights and balances, implying that much effort was invested in maintaining their accuracy. Both balances from Kaupang were found with fragments of a copper-alloy casing, and similar casings are known from another seven, or possibly nine, Norwegian graves. The weights in a grave from Fjære, Aust-Agder,[41] lay inside a leather purse, wrapped in birch bark. Another balance from Fjære was found in a leather purse that was wrapped in leather and birch bark.[42] For another two finds there is evidence of weights and balances having been wrapped in textile and birch bark respectively.[43] About a third of the graves from South-Eastern Norway had evidence of remains of boxes, leather purses, wood fragments, or textiles in which the weighing equipment either was, or may have been, wrapped (Pedersen 2000:fig. 5.3). Given the accidental find circumstances or unskilled excavation of many of the finds, the original frequency of the phenomena was probably considerable higher. Although observed in graves, this presumably reflects the everyday handling of the equipment. In the few cases where such information has been noted, there are indications that weights and balances were part of the deceased's costume, hanging down from the belt, in a purse, case or bag (Nicolaysen 1886:33; Hougen 1923). This has also been observed in Birka's well-documented graves, where wrapping is even more pronounced (Kyhlberg 1980b:212 and 217).

6.3.2 Standards

The existence of different weight-standards and systems has been demonstrated by several studies (Brøgger 1921; Steinnes 1927; Kyhlberg 1980b; Sperber 1996). These studies will be presented and discussed in the following to provide a background for the identification of weight standards at Kaupang. A. W. Brøgger's *Ertog og Øre* of 1921 has been particularly influential in later studies of metrology. Based on a group of weights from Norwegian graves, Brøgger (1921:85) postulated a Late Viking-period weight-unit *øre* of 24.59 g, divided by three to an *ertog* of 8.19 g. His exact numbers are based on the single weight that gives the highest øre, a lead weight of 12.295 g, said to represent ½ øre (Brøgger 1921:84–5). His choice is surprising and unfortunate as this is a heavily damaged, conical weight. The poor preservation of the two lead weights in the grave in question is even described in the museum catalogue and thus could not have arisen after Brøgger's study.[44] In other respects his study is based on better preserved weights:[45] for instance his assessment of a series of copper-alloy weights from Setesdal and Telemark (Brøgger 1921:81–2) is consistent with their good present state. Amongst the in total 23 listed weights there are eight øre-weights of 23.334–24.442 g, one ertog of 7.942 g and three half-øre of 11.826–11.971 g (Tab. 6.7). According to Brøgger (1921:80–4; 1936:79) this ertog/øre-standard is closely related to the oblate spheroid weights of copper alloy, but a few weights of lead and copper alloy/iron from other districts belong to the group as well. Although Brøgger did not note this, the slightly lower weight in grams of some of the latter weights is probably the result of their being slightly affected by corrosion, to judge by their present state.

According to Brøgger (1921:8 and 16), the ertog/øre-standard succeeded an "old Norwegian" øre fixed at 26.8 g and sub-divided by seven. Again he fixes the øre by the heaviest weight in the group (Brøgger 1921:6–7). Unlike for the ertog/øre-standard, Brøgger (1921:4) could base his study in this respect on five well-preserved sets of weights with striking similarities, dating from the Migration Period into the Viking Age.[46] The historian Asgaut Steinnes (1927) demonstrated that the construction of these sets to achieve a wide range of different weights is an aspect that goes hand-in-hand with the calibration of each individual weight to a common standard. Steinnes's critical commentary upon Brøgger's study proved it more likely that the early øre was divided into 20 units (of c. 1.3 g) (Tab. 6.6). This gives less deviation of each single weight and moreover demonstrates that these were highly useful sets. Steinnes (1927:15–6) suggested that the name of the smaller unit could have been *penningr.* This is an old designation in Norway, referring to the smaller units of an øre. After AD 1047, 1 øre in Norway could be divided into 16, 20, 30 or 60 pennings depending on the varying standard of the coinage (Steinnes 1927: 15). According to Steinnes, it is not unlikely that it originally referred to a twentieth, as the penning has been used in Anglo-Saxon. In the following I will adopt Steinnes's suggested term penning/øre when referring to the earlier øre, just like I have adopted Bøgger's ertog/øre when referring to the later øre (for a thorough discussion of weighing related terms and their use see Kilger, this vol. Ch. 8). Steinnes (1927) demonstrated that the penning-units could be counted in halves and quarters. Accordingly some of the sets could produce any quarter-, half- or complete penning over a considerable span.

With the Viking-period set of lead weights from Jåtten, Jæren[47] (Tab. 6.6) any whole, half or quarter of a penning up to 3½ øre (70 pennings) could be produced using its series of 1½, 2, 3, 4½, 5¾, 10, 20 and 30 pennings (Steinnes 1927:9). Steinnes based the theoretical common denominator (~1.334 g) on the five smallest weights, with the result that his theoretical weights of ½, 1 and 1½ øre are all slightly too low. In my opinion the strikingly precise correspondence between the 2 penning and the 1 øre (20 pennings)

Units	Actual weight	Theoretical weight (after Steinnes: 1.33385 g)	Theoretical weight (after 1 øre/2 penning weights: 1.34 g)
30 = 1½ øre	40.345 g	40.016 (-0.329)	40.200 (–0.145)
20 = 1 øre	26.805 g	26.677 (-0.128)	26.805
10 = ½ øre	13.456 g	13.339 (-0.117)	13.400 (–0.056)
5¾ penning	7.662 g	7.670 (+0.008)	7.705 (+0.043)
4½ penning	5.993 g	6.002 (+0.009)	6.030 (+0.037)
3 penning	4.045 g	4.002 (-0.043)	4.020 (–0.025)
2 penning	2.680 g	2.668 (-0.012)	2.680
1½ penning	1.962 g	2.001 (+0.039)	2.010 (+0.048)

Table 6.6 *All the weights in the set from Jåtten (after Steinnes 1927, with additions).*

weights points towards 1.34 g as an even better common denominator (Tab. 6.6) – if so, this weight-set is even better calibrated to a common standard. Kilger (this vol. Ch. 8.3) emphasises the grain as the building block of the weigh-system. For example he regards Steinnes' 1.33 g unit as 20 grains of 0.067 g and accordingly Steinnes' 2 penning as 40 grains. Regardless of how its weights are described, the Jåtten set is undoubtedly precicely calibrated and a highly useful tool for weighing. This hoard from Jåtten contains a balance of Steuer's type 2 and it can therefore be dated to the 10th century[48] (Steuer 1987:462 and liste 6a, 1997:24).

In Brøgger's mentioned list of the ertog/øre-weights from Setesdal and Telemark (Tab. 6.7), all the weights are massive weights of copper alloy and all but three are from the same grave at Nomeland, Valle, Aust-Agder.[49] This grave is coin-dated post-AD 1065/1080 (Skaare 1976:catalogue no. 70). No balance is reported to be found, but as the grave was not professionally excavated one may have been lost. Some of the weights in the list are only briefly mentioned by Brøgger; for instance the two weights of 4.481 and 4.803 g and three weights of 12.9–13.5 g (Tab. 6.7). As we have just seen, the three latter weights correspond very well to half of an early øre, but Brøgger dismisses the combination as a mixture of old and new without any further discussion. According to him, there is no rational relationship between these weights and the ertog/øre-weights (Brøgger 1921:82).

Neither Brøgger nor Steinnes has commented on a few hints of a possible fusion between the early and later øre. Running through Brøgger's list from Nomeland with the three early half-øre as a basis for three different theoretical common denominators (see Tab. 6.7), it seems evident that several weights could actually represent pennings as discussed by Steinnes. Some of the Nomeland weights could represent 1½, 3¼, 3½, 4½, 5 and 5½ pennings. There are remarkably small deviations from the common denominator, but it should be noted immediately that my tentative calculations are subject to much larger critical problems than Steinnes's study. All these weights are from the same grave, but they most likely originated from several slightly different sets and it is far from obvious which weights belong to each set. I have suggested it is the weights that show the least deviation from a common denominator that originally belonged to a set, but this is not necessarily true. Moreover, even more weights may originally have been deposited in the grave. One weight from the grave (of 1.239 g) is not listed by Brøgger, probably because it is a bit corroded. It is further possible that some weights were lost during the non-professional excavation in the early 19th century. According to the museum catalogue (C30539) further weights reported to be from this farm could originally have

41 C7838–44.

42 C8278–85.

43 C4188–97 and C XXX–MXXXII.

44 C17669 Valle, Tune, Østfold. Their present weights are also roughly in accordance with Brøgger's figures, and it is therefore unlikely that there has been a misplacement.

45 I checked the available weights from South-Eastern Norway at KHM in Oslo in 1999.

46 Brøgger (1921:3; 1936:75, note 10) dated the C525, Bråten, Buskerud, set to the 2nd–3rd centuries, but it has later been dated both to the Migration Period or later (Kyhlberg 1980b:164), and to the Merovigian period (Kilger, this vol. Ch. 8:283).

47 B4772.

48 Steuers dating of the type is inconsequent. Elsewhere he suggests a date between the last decades of the 9th century and the third quarter of the 10th (Steuer 1997:abb. 165).

49 C30539.

Actual weight	Ertog/(later) øre (after Brøgger)	Penning / (early) øre	Based on ½ early øre: 1.345 g	1.305 g	1.293 g
24.442 g	1 øre				
24.416 g	1 øre	18 pennings	(–0.206)		
(23.914 g)*	1 øre				
(23.879 g)**	1 øre				
23.803 g	1 øre				
23.414 g	1 øre	18 pennings		(+0.076)	
23.370 g	1 øre	18 pennings			(–0.096)
(23.334 g)***	1 øre				
13.452 g		½ øre (10 pennings)	= 13.452 g		
13.050 g		½ øre (10 pennings)		= 13.050 g	
12.928 g		½ øre (10 pennings)			= 12.928
11.971 g	½ øre	9 pennings	(+0.134)		
11.894 g	½ øre				
11.826 g	½ øre				
7.942 g	ertog	6 pennings	(+0.128)		
7.391 g		5½ pennings	(+0.007)		
6.509 g		5 pennings		(+0.016)	
6.485 g		5 pennings			(–0.020)
6.061 g		4½ pennings	(–0.009)		
4.803 g		3½ pennings	(–0.096)		
4.481 g		3½ pennings			(+0.045)
4.271 g		3¼ pennings		(–0.030)	
2.071 g		1½ pennings	(–0.054)		

Table 6.7 *Weights from Setesdal and Telemark (after Brøgger 1921:81–2, with additions). All the weights are from the same grave (C30539), with the exception of * (from C1671–2) ** (from C13781–7) and *** (from C22234).*

belonged to this grave. As we might expect any quarter of a penning to be present, the smallest penning-weights should also be regarded as uncertain due to the considerable difference between the common denominators implied by the early half-øre weights. In any event, this grave provides evidence of the use of weights of the early øre towards the end of the Viking Period. This is not surprising as an øre of c. 26 g was still in use after the Viking Period (Steinnes 1936:92).

Isolating the early øre-weights based on 1.345 g (Tab. 6.7), a penning/øre-set with units of 1½, 3½, 4½, 5½ and 10 pennings may be represented in the Nomeland grave. The fact that this is a highly useful set, giving all half and whole pennings up to 1 early øre, seems to strengthen the case that these weights originally constituted a set. It is also obvious that this hypothetical set was found together with ertog/øre-weights. In my opinion it is even possible that there is a rational relation between this set and some of the ertog/øre-weights – in contrast to what Brøgger (1921:82) claimed. Even a later øre, a later half-øre, and an ertog, could have been calibrated to this theoretical common denominator of 1.345 g, although the deviation is slightly higher. This possibility seems strengthened by the fact that two of the other later øre-weights (of 23.370 and 23.414 g) are even more closely calibrated to the same denominators (1.293 and 1.305 g respectively) as two early half-øre from the grave (Tab. 6.7). Compared to Brøgger's early øre-sets like Jåtten, there is nevertheless a noteworthy difference in that no weights of 1 early øre or multiples thereof are represented at Nomeland.

It is possible that the later øre, its half and the ertog, do belong to the same set as the penning-weights, and they could in fact be seen as 18, 9 and 6 pennings. Although there are uncertainties attached to the Nomeland set and the hypothetical calculations above, the find nevertheless seems to suggest an inter-relationship between the early and later øre. Even the other way around, some of the smaller penning-weights in the Jåtten set could equally fit well into the system of ertog/øre. 1½ and 3 pennings correspond to half and a quarter of an ertog respectively, and a hypothetical 6 pennings would actually correspond to Brøgger's ertog. In the hypothetical Jåtten set based on 1.34 g, 6 pennings would have had a weight of 8.04 g. No such weight is represented there, but a 6-penning weight of 7.923 g has been identified by Steinnes (1927:10) in the Viking-period set of lead weights from Sævli, Fjære, Aust-Agder (Tab. 6.8).[50] This set otherwise shows a strong resemblance to the other early øre-sets, with an øre of 26.289 g and 1½, 2, 3, 5¾ penning, half- and 2 early øre-weights (Steinnes 1927:10–1). The Sævli set was found in a grave that could be dated between the last decades of the 9th century and the first half of the 11th by its balance of Steuer's type 3 (Steuer 1987:liste 6, 1997:abb. 165). The set from Sævli is clearly internally calibrated – not as perfectly as the set from Jåtten, although, as Steinnes has emphasised, the 6-penning weight is closely in agreement with the 2-(early) øre weight. The sets of weights from Jåtten and Sævli, and the Nomeland grave, thus draw attention to the fact that the ertog/øre-units were integrated with the earlier, long lasting penning/øre-system. This might point towards the penning as the stable element in the Scandinavian weight-system while the number of pennings that constituted one øre changed. The relationship between the penning and the two different øre will be considered further in the discussion of the weights from Kaupang (below, 6.3.3).

The ertog is a crucial element according to Brøgger's study, but amongst the weights from South-Eastern Norway outside Kaupang it is much less pronounced (Pedersen 2000). Besides the Sævli and Nomeland sets with their penning elements only one other well preserved weight of 8 g (+/– 0.5 g) is represented in the corpus (of 7.69 g).[51] A brief comparison of the Jåtten and Sævli sets further demonstrate that there are considerable differences between different weight-sets, despite their internal calibration and good preservation. This difference will be kept in mind when the weights from Kaupang are analysed below (6.3.3).

Brøgger's early øre corresponds to a Dublin unit of 26.6 g outlined by Patrick F. Wallace (1987:212). According to Wallace, the weights found in the settlement of Dublin were adjusted to this standard, with the exception of oblate spheroid copper-alloy weights adjusted to a standard of c. 24 g. Sperber (1996:110) has observed some geographical variance in the latter type. He suggests that the oblate spheroid copper-alloy(/iron) weights from Birka and Gotland are related to two slightly different weight systems with a unit weight of 4.0 g and of 4.23 g respectively. He considers the standard on Gotland to refer to the *mitqāl* of 4.233 g – the ideal Islamic gold weight (Sperber 2004:62; see also Kilger, this vol. Ch. 8.5). Local variation is likewise observed with the cubo-octahedral weights from Birka. According to Sperber (1996:110) they belong to two different systems or types of weight-set. Both the systems are related to a unit of 12.7 g, but are divided differently (giving sub-units of 0.705/1.41/2.822 g and 0.795/1.59/3.17/6.35 g respectively). 12.7 g represents three *mitqāl*. Sperber (1996:110; 2004:62) describes the two systems as the Islamic market- (dirham-) system and the Islamic-Swedish system. The lead weights at Birka with a weight below 5 g also belong to the former system in his view, while the larger lead weights have a unit weight of 8.22 g, representing two *mitqāl* (Sperber 2004:72–3). Kilger (this vol. Ch. 8:305) has suggested that the differences between Birka and Gotland might reflect two different traditions for calibrating the weights and not necessarily two different systems. In his opinion it is highly possible that slightly different objects (or type of grains) were used when calibrating the weights at different sites. I will return to the question of calibrating and the presented units when discussing the well-preserved weights from Kaupang (below, 6.3.3).

Units	Jåtten	Sævli
40 = 2 øre		52.998 g
30 = 1½ øre	40.345 g	
20 = 1 øre	26.805 g	26.289 g
10 = ½ øre	13.456 g	12.923 g
6		7.923 g
5¾	7.662 g	7.332 g
4½	5.993 g	
3	4.045 g	3.857 g
2	2.680 g	2.558 g
1½	1.962 g	1.856 g

Table 6.8 *The sets of weights from Jåtten and Sævli (after Steinnes 1927).*

In the last three decades, the study of weight-units has developed into a highly specialized discipline characterized by advanced statistical and metrological examinations (Kyhlberg 1980b; Sperber 1996). In some statistical approaches the calculations themselves sometimes appear as the main objective while the cultural historical context of the weights is neglected. Sperber's (2004) latest study of the weights from Birka's settlement excavation of 1990–1995 illustrates the importance of an integrated and contextualized study of weights from settlement contexts. For instance he wonders how the weight-users at Birka could separate weights based on the very similar standards from each other without discussing the fact that his study includes weights used over a period of 200 years (Sperber 2004:68). It is possible that the question would be irrelevant if the stratigraphy at Birka were taken into consideration. Due to

48 Steuers dating of the type is inconsequent. Elsewhere he suggests a date between the last decades of the 9th century and the third quarter of the 10th (Steuer 1997:abb. 165).

49 C30539.

50 C8272–3.

51 C20133 Bergan, Hedrum, Vestfold.

the "plough-layer character" of the weight assembly at Kaupang, a study of weight-units here will be subject to similar problems. As Kyhlberg (1980b:163) has put it, these weights are metrological stray finds. The material cannot be used to pinpoint the weight-standard at any given time, or changes in the use of weights and standards over time. Nevertheless a more general picture will be presented in section 6.3.3, below, based on the well preserved weights from the settlement of Kaupang. Due to the relatively good preservation of the lead weights at the site, a discussion of standards can be based on a large number of weights. It should however be kept in mind that the general trends reflect quite a long time-span, possibly including several changes over time.

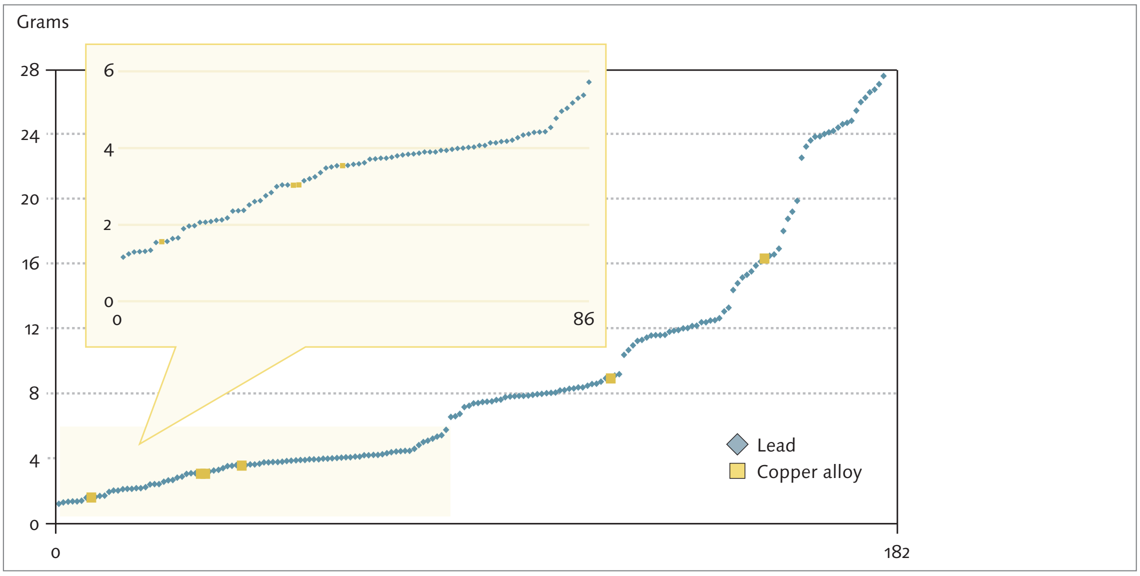
As the discussion so far has shown, sets of weights have been at the centre of attention in metrological studies. When analysing the weighing equipment in Norwegian graves it is apparent that three main groups of graves can be identified: graves with a single weight, graves with a set of weights and a balance, and graves with just a balance (Pedersen 2000:66–9, 2001b:26). While the last group seems to be the product of unprofessional excavations or accidental discoveries of graves, the complete set and the single weight seem to reflect two distinct Viking-period deposition traditions. Graves with a single weight are also a common phenomenon at Birka (Kyhlberg 1980b:201). This could reflect the handling of weights in connexion with the burial and have no reference or relevance to the everyday, practical use of weights. However the ability to test a trading partner's set of weights is a good functional explanation for possession of a single weight (Sperber 1989:95). This interpretation is also relevant to the weights in the settlement at Kaupang. It is therefore uncertain that they all originally belonged in sets – some may have been test weights.

6.3.3 The weight of well-preserved weights from the settlement

Sperber (2004:72) has combined visual studies of the lead weights from Birka with measurements of their density. This proved that weights with at most fine or medium fine cracks were very well preserved, and only marginally affected by corrosion. The well-preserved weights from Kaupang have a similar appearance and so can shed light upon standards and units. In general, the 192 well-preserved weights from Kaupang (Fig. 6.18) imply the real existence of weight-standards. In particular, the lacunae appearing amongst the heavier weights and the strong concentration of weights around 8 g (± 0.3 g), and minor clusters around 12 g (± 0.3 g) and 24 g (± 0.5 g) seem to underline the existence of a principal standard comparable with Brøgger's later øre of c. 24 g divided into halves (half-øre) and thirds (ertogs). It is especially interesting that as many as 16 weights (8%) may represent the ertog of 8 g as this weight has proved to be rare amongst weights from elsewhere in South-Eastern Norway (above, 6.3.2). Even some of the larger weights (off the graph) are approximate multiples of 24 g, as, for instance, 1½ (36.3 g) and 4 (98.78 g). The most marked concentration of weights is found around 4 g (± 0.25 g) with 23 specimens (12%). This group, and another smaller concentration of 9 weights (5%) around 2 g (± 0.2 g), could be further evidence of Brøgger's younger ertog/øre, although, as discussed above, these are also essential units of the early øre as identified by Steinnes – respectively 3 and 1½ pennings. In general the ertog/øre-units are much more evident than the pennings/øre at Kaupang – suggesting that the former is the most credible system. In what follows, therefore, these units will be referred to as half- and quarter-ertogs. The early øre itself and its half are represented, but to a very modest extent, by only three possible half-øre of 13 g (± 0.5 g) and four possible øre of 26.5 g (± 0.5 g). Using the Jåtten and Sævli finds as comparanda, it is striking that no 1½ (c. 40 g) or 2 early øre (c. 54 g), or 4½-penning (c. 6 g) weights have been found. The continuing series around 7.7 g might, on the other hand, represent 5¾ pennings, but it is impossible to distinguish this unit from the ertog concentration around 8 g. All in all, the weight-assembly from Kaupang demonstrates beyond doubt that the penning/øre-weights, as represented in the weight-sets from Jåtten and Sævli, were marginal. In this respect the assemblage has more in common with the Late Viking-period grave from Nomeland with its strong ertog/øre element combined with a few pennings of different sizes (above, 6.3.2).

Compared with the material from the excavations in the Black Earth at Birka of 1990–1995 (Sperber 2004:lists 1–11), the corpus of weights from Kaupang lacks the smallest weights. At Kaupang there is just one weight that was originally less than 1 g, a

Figure 6.18 *Well-preserved weights from the settlement sorted according to weight. (No–28 g = 182, No–6 g =86). Off the graph: 28.2, 31.40, 32.11, 33.56, 36.3, 37.21, 37.69, 42.63, 50.29 and 98.78 g weights (all lead).*



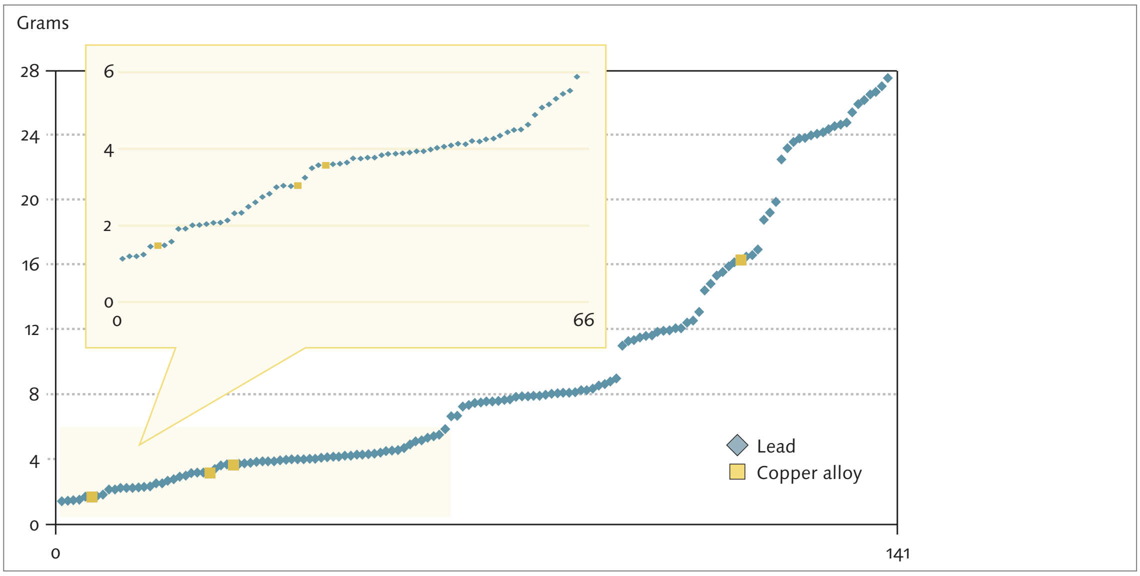
small cubo-octahedral weight of 0.32 g.[52] This is altered a little more than the weights presented in Figure 6.18 (see Appendix 1) and was found during the excavations. In Sperber's list of the weights from Birka 1990–1995, on the other hand, there are almost forty lead weights below 1 g, most of them well preserved. This striking difference between the two assemblies may be explained by the fact that 74% of the weights from Kaupang 1998–2003 were found with a metal-detector in the modern plough-layer – a method that favours larger objects.

Figure 6.18 includes all possible weights and even irregular weights that might be miscast and is subject to some uncertainty, but the general picture is the same even if these are excluded (Fig. 6.19). Acceptance of the uncertain and irregular objects as weights is thus corroborated.

The larger number of weights of a relatively small size agrees with the character of the settlement finds. In general these consist of small objects, compared with the graves, a phenomenon that is especially pronounced with the glass beads (Wiker, in prep.). The larger weights were probably more easily retrieved if dropped. There could, moreover, be additional explanations for the high-number of half-ertog weights of c. 4 g. Firstly, weights of this small size would function well as a single weight for testing a trading partner's set of weights (above, 6.3.2). Secondly, weights of 4 g appear to be present in many weight-sets, leading Steinnes (1927:14) to suggest that *this* was the original weight-unit. According to Steinnes the Bråten set[53] has a series of ¾, 1, 1½, 2, 2¼, 3 and 4 pennings along with larger weights. Here ¾, 1½, 2¼, 3 and 1, 2, 3, 4 respectively constitute two arithmetical series, both including the 3 pennings, corresponding to c. 4 g.[54] Taking a closer look at the major concentrations in Figures 6.19 and 6.20, at 4, 8 and 12 g, they actually constitutes another arithmetical series – either as a series of ½, 1 and 1½ ertogs or 3, 6 and 9 pennings. This series could be continued with 16, (20) and 24 g, which is 2, (2½) and 3 ertogs, or 12, (15) and 18 pennings. 20 g, however, is represented by only one cylindrical lead weight. In the Norwegian weight system from the medieval period the ertog is a major unit (Brøgger 1936:78), but at Kaupang c. 4 g (half an ertog), its multiples and its half, are even in evidence. Sperber (1996:83) has earlier observed a 4-g unit amongst the oblate spheroid weights of copper alloy/iron from the graves at Birka while the lead weight in the group of 5–40 g there had a slightly higher unit weight of 4.11 g, termed a *mitqāl* by Sperber (2004:73).

Christoph Kilger (this vol. Ch. 8:316) has introduced the term *þveiti* as a possible Scandinavian term for the half-ertog (c. 4 g). While the weights of 12, 20 and 28 g immediately suggest themselves as multiples of the *þveiti* rather than of the ertog, the possible existence of a *þveiti* of c. 4 g and an ertog of c. 8 g complicates the study of the weights from Kaupang. Other major concentrations are either multiples of both, namely 8 and 16 g, or, like 24 g, a multiple of the *þveiti,* the ertog and the half of an øre, i.e. 12 g. *A priori,* the general picture from Kaupang with a similar distribution of the weights along the horizontal axes of 4 and 8 g nevertheless suggests that the possible *þveiti*-weights and ertog/øre-weights are closely related. The term *þveiti* is accordingly linked to ertog/øre in the following, while the discussion of the punched-dot decorated weights (below, 6.3.4) will address the relationship between the *þveiti* and the ertog/øre in more detail.

52 C52516/4097.
53 C525 see note 46.
54 The theoretical weight is 3.972 g while the actual weight in this set is of 3.750 g (Steinnes 1927:14).



A hypothetical weight-standard could be calculated from the well-preserved, regular weights (Fig. 6.19), but due to their considerable variation and the clear tendencies it seems to be of limited interest. The simple plotting of the well-preserved weights clearly demonstrates the wide variation that hides behind earlier suggested standards (e.g. the weight catalogue of Sperber (2004)). The lack of distinct clusters amongst the lightest weights and the considerable variation in general illustrate that there was no strict adjustment of all weights to precise units. The cluster of weights around 24 g might serve as an example. Even though a few weights have an almost identical weight just below 24 g there is a continuous series of ten weights from 23.54–24.76 g; much more than corrosion and the inaccuracy of the balances could account for (above, 6.3.1). At this general level the weights at Kaupang seem to express the intended adjustment of a considerable proportion of the weights, but not the really precise adjustment of them all to one strict standard.

Nevertheless, just as individual sets of weights may have been internally calibrated, such a set could have been as accurate as the Jåtten set (Tab. 6.6). The variation witnessed for the clusters in Figure 6.19 actually corresponds to the considerable variation witnessed between internally calibrated sets such as those from Jåtten and Sævli (Tab. 6.8). Furthermore, judged from the distribution along the horizontal axes of Figure 6.19, it seems highly likely that 2, 4, 8, 12 and 24 g lie close to the values to which it was intended to calibrate many of the weights at Kaupang. As multiples of 4 g are so pronounced, this weight – and its half, 2 g – *a priori* could be suggested as the common factor of the majority of the weights, apart from the smallest ones. However, judged from the weight-sets in the graves from Sævli and Nomeland (above, 6.3.2), it is also possible that the weights corresponding to Brøgger's ertog/øre could have the same common denominator as the weights that correspond to Steinnes's penning/øre. Assuming that the weights were calibrated as Steinnes has suggested for the sets like Jåtten and Sævli, the common denominator (his 1 penning) should lie close to 1.3 g.

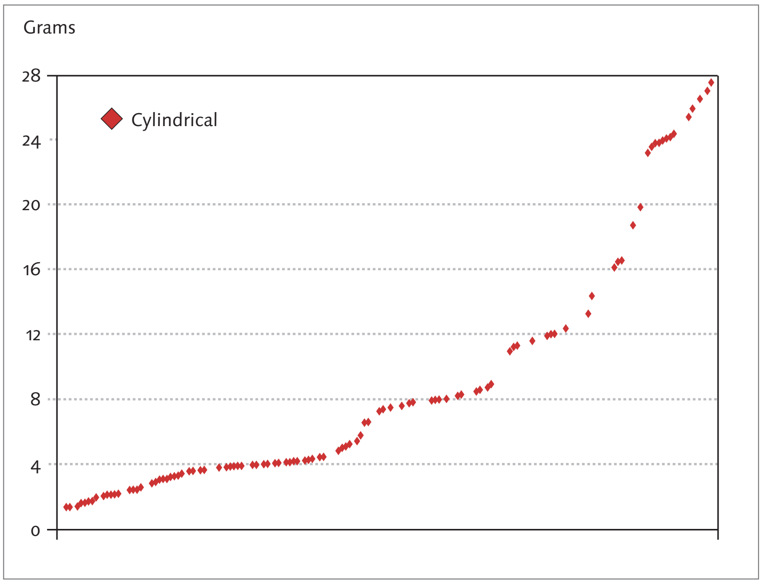
As lead weights were produced at Kaupang (below, 6.4.3), calibration took place locally.The roughly similar distribution along the horizontal axes of 2, 4, 8, 12 and 24 g indicates that weights of each size were calibrated according to the same common denominator. Unity was probably achieved by calibrating these weight-sets against a specific type of object. This could have been an existing weight or another weight-adjusted object such as the Merovingian gold coin as suggested by Kilger (this vol. Ch. 8:284–6). Correspondingly, Kyhlberg (1980b:154 and 164) has regarded a tremissis of 1.294/1.296 g as the common reference point for the lead weight-set from Colonsay, Scotland. The tremissis found at Kaupang has a weight of 1.25 g, but, as Kilger has emphasised, it has a little damage and may originally have weighed c. 1.3 g.

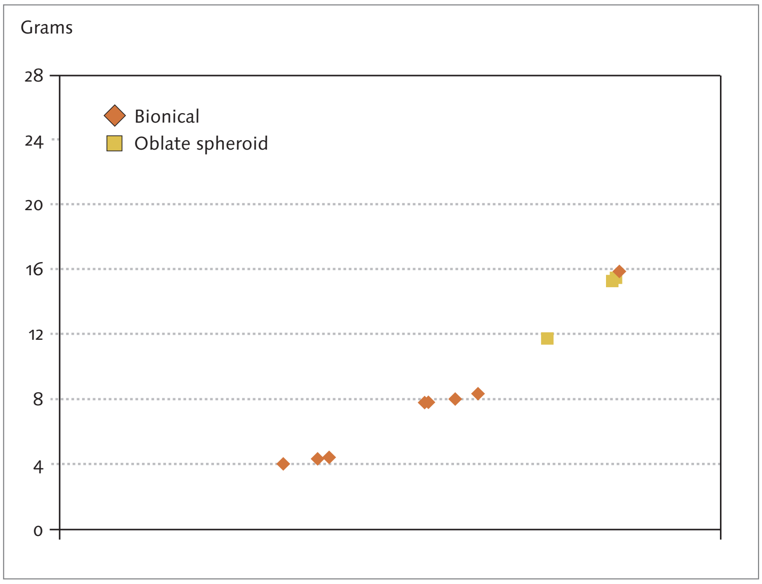
The corresponding variation within the clusters of 2, 4, 8, 12 and 24 g indicates that the weights once belonged to sets calibrated slightly differently. As it is relatively unlikely that all the weights from each individual set ended up as accidental losses at the site, this seems to imply that a larger group of weight-sets were once calibrated against the same object. The variation suggests that the weights of these objects varied slightly, possibly through time, and hence that several slightly different objects were used for calibration. In the analyses of the punched-dot decorated weights, below (6.3.4), the question of calibration will be discussed in more detail.

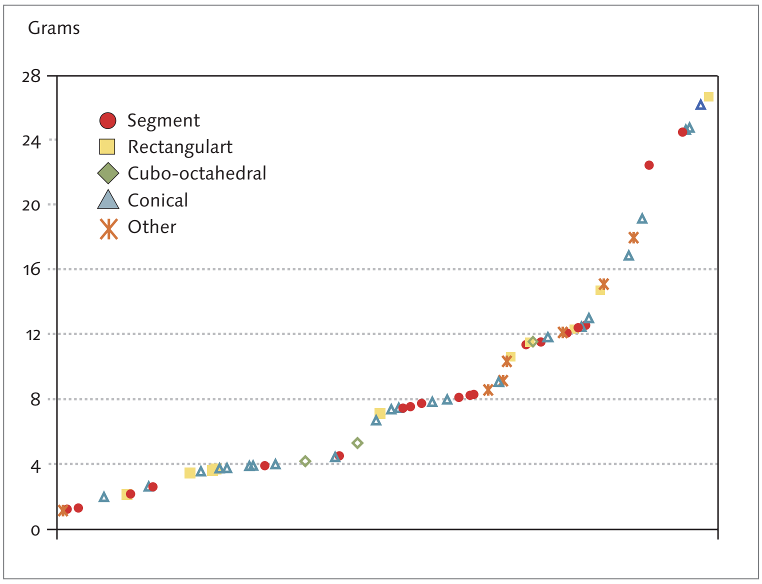
It is essentially the lead weights we can consider, and these weights that were adjusted to the þveiti/ertog/øre of c. 4, 8 and 24 g (Fig. 6.18). None of the copper-alloy/iron weights, and only six copper-alloy weights, could be included in the group of well-pre-

Figure 6.19 *Well-preserved weights from the settlement sorted according to weight. Irregular and uncertain weights excluded (No–28 g = 141, No–6 g =66). Off the graph 31.40, 32.11, 37.21, 37.69 and 98.78 g weights, all lead.*

Figure 6.20 *All well-preserved lead weights from the settlement sorted according to weight (N=176). Off the graph 28.2, 31.40, 32.11, 33.56, 36.3, 37.21, 37.69, 42.63, 50.29 and 98.78 g weights.*







served weights already discussed. The þveiti/ertog/øre-units are well represented amongst different types of lead weight, but the biconical and oblate spheroid lead weights stand out for being especially well adjusted to this standard (Fig. 6.20). Accordingly the settlement finds from Kaupang demonstrate that the few weights of lead of this standard which Brøgger observed in grave finds from rural areas along with the many oblate spheroid copper-alloy (/iron) weights belong to a much larger, heterogeneous group of lead weights.

Above, it was regarded as highly likely that a considerable proportion of the lead weights from disturbed contexts belong to the 9th century (6.2.3). This suggests that the þveiti/ertog/øre-standard was in use in the settlement at Kaupang in that century. It is only the five (six) lead weights from SP II in the MRE that can be regarded with any degree of certainty as roughly contemporary. Four of these are so well preserved that their weight is little altered by damage or corrosion (Tab. 6.9). One, the biconical weight from Plot 1A, has a weight comparable to Brøgger's ertog. This might suggest that a third of an øre of c. 24 g was already in use in the second quarter of the 9th century. With the foregoing discussion on the early øre in mind, it could just as well indicate that the use of the 6 pennings from the earlier øre-system of c. 26 g had begun by this date. Seen in relation to the general picture, with a large number of þveiti/ertog/øre-weights (Figs. 6.18–6.19), the former may appear most likely, but such a conclusion is unreliable as a change may have happened before the rest of the weights were lost. The unique weight of 28.2 g from Plot 3B does, however, support the existence of the þveiti/ertog/øre-standard as early as the second quarter of the 9th century. It is a multiple of a *þveiti* of 4 g, like the majority of the weights at the site. When combined it seems quite possible that these weights should be regarded as þveiti/ertog/øre-weights. This is a very limited statistical basis, but these two þveiti/ertog/øre-weights nonetheless make up 40% of all the weights from SP II. Even the slightly less well-preserved cylindrical weight of 21.67 g from Plot 2A with a possible SP II date (above, 6.2.1) is most likely 1 later øre. It has only minor damage. A couple of grams at most have been lost, suggesting an original weight of just below 24 g.

A fractionally higher common factor of 4.11 g has been suggested for the 17 larger lead weights from Birka (Sperber 2004:73). Their context has not been discussed in detail, but according to Gustin (2004c: 94), only a few lead weights were deposited at Birka after the introduction of the cubo-octahedral weights c. AD 860/870. Accordingly it seems possible that some of the þveiti/ertog/øre-weights there were also lost before c. AD 860/870, but this conclusion awaits a future study of the context of the Birka weights. Moreover, in Ribe 23 of 24 lead weights belong to stratified contexts that pre-date AD 850 (Feveile and Jensen 2006:fig. 9.36). The original weight of these objects is more uncertain than the Kaupang ones, but Feveile and Jensen (2006:143) have noted that there is a tendency towards multiples of 4 g there as well. One weight of 8.09 g belongs to a phase dated AD 800–820, while two weights of 12.24 g and 28.83 g belong to phases dated AD 800–850 and AD 820–850, respectively (Feveile and Jensen 2006: 130, figs. 9.36 and 9.12). Accordingly the possible use of þveiti/ertog/øre weights at Kaupang in the second quarter of the 9th century seems to fit into a larger picture, although this cannot be established beyond doubt.

The weight of 7.54 g from Plot 3B could on the other hand be regarded as 5¾ pennings, compared with the Sævli and Jåtten sets (Tab. 6.8). It seems less likely that this weight could be an ertog, as the lowest øre in Nomeland (Tab. 6.7) would give an ertog of 7.79 g and just a single later øre-weight of 22.48 g from Kaupang would give a consistently light ertog. As discussed above, this weight belongs to a larger group of potential 5¾ penning weights. Likewise, the 5.03 g weight could be 3¾ pennings. This weight too has some close parallels at Kaupang, being comparable with cylindrical lead weights of 4.95 g and 5.17 g. Like the Jåtten and Sævli sets and the Nomeland grave, even this small group of weights from SP II thus suggests that the þveiti/ertog/øre-system and the penning/øre-system were in use simultaneously. These weights could belong to several different sets, but as they represent units of different sizes, like the sets from the graves, it seems possible that the weights from the two systems at Kaupang in SP II formed highly practical sets, with which the user could achieve a wide range of different values (Steinnes 1927). The well preserved weights from Kaupang as a whole do not disprove an interwoven character of the two systems as suggested above (6.3.2), but cannot provide a strong argument in favour of it either, due to the fact that these weights may belong to different sets of weights and to separate times.

Amongst the well preserved copper-alloy weights, there is one possible cylindrical weight (8.91 g), one possible conical weight (3.03 g), the late 10th-century pear-shaped weight (Fig. 6.12.a of 16.28 g) and three cubo-octahedral weights (Tab. 6.10). The pear-shaped weight fits the þveiti/ertog/øre-standard, but none of the cubo-octahedral weights do. They seem rather to correspond to the system for this type of weights earlier suggested by Sperber (above, 6.3.2). The weight of 3.539 g is exactly proportionate to a dirham according to Sperber (1996:55 and 64), at 5:4, and corresponds with his so-called Islamic system. The weight is, moreover, a multiple of the smallest weights of 0.355 g that Steuer (1987:463 and 477) has identified in Hedeby and Birka. The lightest cubo-octahedral weight of 1.558 g corresponds to Sperber's so-called "Swedish/Islamic" system from Birka in which the unit of 1.59 g is prominent (Sperber 1996: 110). The weight of 3.038 g corresponds to roughly double the weight of 1.558 g, but was then most likely calibrated against a slightly different object. Hitherto, the production of cubo-octahedral weights has not been demonstrated at Kaupang, and it is therefore possible that the weights were calibrated at widely different places before being brought to Kaupang. A comparison with the lead weights demonstrates that these sizes of cubo-octahedral weights of copper alloy are represented in lead as well, but due to the more or less continuous series of lead weights of this small size it is hard to judge whether or not this is merely a coincidence.

Museum no.	Weight (g)
C52517/507	1.558
C52517/2523	3.038
C53160/7	3.539

Table 6.10 *The weights of well-preserved cubo-octahedral weights of copper alloy.*

The spherical weights of copper alloy/iron are generally very poorly preserved, but, based on an evaluation of the weight and the size of the best preserved ones, it seems likely that ½, 1 and possibly 1½, 2½ and 4 later øre-weights are represented amongst them. Their original weight in grams remains undetermined.

6.3.4 Punched-dot decoration on the weights from the settlement

Weights could be decorated in a wide variety of ways (below, 6.4.4), and the most common type of decoration found at Kaupang is different types of punch-marks in the form of dots. This kind of decoration is quite common on Viking-period weights and has

	Type	Changed	Weight	Plot	
C52519/20388	Cylindrical	Much	4.29	3A	SP II, sub 2
C52519/24586	Cylindrical	Little	5.03	3A	SP II, sub 2
C52519/16578	Cylindrical	Little	7.54	3B	SP II, sub 2
C52519/20041	Biconical	Little	8.00	1A	SP II
C52519/16583	Cylindrical	Some	21.67	2A	SP II sub 2?
C52519/17263	Unique	Little	28.20	3B	SP II, sub 2

Table 6.9 *The weights from SP II.*

repeatedly been discussed in relation to weight-standards and -units (Brøgger 1921:106–7; Kyhlberg 1980b:270–1; Steuer 1987:abb. 15–6, 1997; Sperber 2004:73–5). Two slightly different interpretations of these punchmarks have been proposed. They have either been seen as marking the position of the weights within a set (Kyhlberg 1980b:270–1) or as marking the weight-units (Brøgger 1921:106–7). In other words the punched-dot decoration has either been regarded as individual or as standardized, although it has also been emphasised that even punched dots could have an ornamental character too (Brøgger 1921:106).

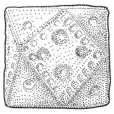
A total of 74 weights from the settlement at Kaupang are decorated with punched dots of different shapes and sizes (Appendix 1): 43 of lead, 28 of copper alloy and 2 of copper alloy/iron. 28 are cubo-octahedral weights of copper alloy and one is the weight of the same type with an iron core. Thus 64% of these weights (N = 45) have traces of punched-dot decoration. It is highly likely that all were originally punchmarked. The same is most likely the case with the oblate spheroid weights of iron with a copper-alloy mantel, but only one has some identifiable remains of punchmarks left. This weight is so badly preserved that the original marking is impossible to reconstruct. Amongst the other types of copper-alloy weights only one rectangular prismatic weight (C52516/3164) is decorated with six punchmarks.

The decoration on the cubo-octahedral weights seems to be quite standardized, all being decorated with circular dots (Fig. 6.21 and Tab. 6.11). These punchmarks vary only slightly. Most were made with a hollow punch, a few with a compact punch, and one with a punch that left a double circle. All the weights with well-preserved punchmarks have dots on all six square sides: in most cases the same number of dots on each side, but in one case different numbers. The latter weight (C52517/507) also differs slightly from the others in its less regular shape. With the exception of this example, the square side is always marked with an even number of punchmarks. Some weights are also marked on the eight triangular sides, in which case always with a single punchmark. On most of the square sides the punchmarks are organised as on a modern die, but on the weight of copper alloy/iron (C52519/13888) they are distributed irregularly. The differences within the group are represented by C53160/7 and C52517/2523. While the former has all the finer details, such as a beaded border on all triangular and square sides (Fig. 6.21.b), the latter is as simple as a decorated cubo-octahedral weight can be, with a plain punchmark and no border.

Only three weights are so well preserved that the punchmarking is all present. Consequently the total number of dots on most weights is more or less uncertain. The overall picture nevertheless suggests that regularity was the norm, and it seems highly likely that the corroded sides had the same number of punchmarks as the well-preserved sides. Thus a total number of punchmarks has been suggested for most weights with several of their sides preserved or partly preserved.

There seems to be a relationship between the number of dots and the weight of the weights. In comparing the weight with the number of dots even the examples that are classified as having undergone "some" alteration can be used. The term "some" describes weights that have not changed too much to give a good indication of the original weight. Table 6.12 is a simplified version of Table 6.11 with all the weights that are much altered or have incomplete decoration (D) excluded. A closer comparison of these weights seems to suggest that it is the number of punchmarks on the square sides and not the total number of punchmarks that indicates the weight. Comparing the weights with six punchmarks on their square sides regardless of the total number of dots, there seems to be four weights that could originally have been around 3.5 g (3.539, 3.307, 3.47 and 3.263 g respectively). While two of these weights definitely have a punchmark on the triangular sides as well, the last certainly has no punchmark on these sides. Allowing for the variation represented by the triangular sides, this little group of weights thus suggests that the marking of the cubo-octahedral copper-alloy weights could have been standardized. There is also a clear tendency for a higher number of dots to coincide with a greater weight. Both weights with only four dots weigh 3.0 g or less, while the weight with

Figure 6.21 *Punched-dot decorated cubo-octahedral weights from the settlement of Kaupang.* ***a.*** *C52519/18388. Drawing, Bjørn-Håkon Eketuft Rygh. Scale 2:1.* ***b.*** *C53160/7 0.9 x 0.8 x 0.8 cm. Photo, Eirik Irgens Johnsen, KHM.*



a

b

two dots weighs 1.6 g or less. The tendency, however, is not a rule. One rather well preserved weight of 2.805 g clearly breaks the pattern, being marked with six dots, while the weight with an unequal number of dots on its rectangular sides, respectively 1 and 2, weighs 1.6 g just like the weight with 2 dots on all its sides. The latter could be brought into the general pattern if we postulate that the highest number of punchmarks on a square side was what counted.

A similar tendency for weight to increase with an increasing number of dots was observed by Steuer (1987:abb. 15) and Sperber (2004:fig. 5.5) but as at Kaupang this is not a strict rule. Their studies of cubo-octahedral copper-alloy weights also demonstrate that uneven numbers of dots, respectively 1 and 3, can in fact be found on the square sides. Such weights might be hiding amongst the poorly preserved examples at Kaupang. None of these weights at Hedeby or Birka, on the other hand, is marked with 5 dots on a square side. Compared with the weights from Hedeby and Birka presented by Steuer, the weights from Kaupang fit into a larger picture well. Amongst the weights with 6 dots there is a marked concentration around 3.5 g and a few weights of c. 2.8 g, as at Kaupang. The most distinct concentration of weights with 4 dots is around 2.8 g with a tail up to 3.0 g, which is slightly lower than the two weights at Kaupang. Two dots has a main cluster around 1.6 g, as at Kaupang.

As already discussed, it is possible that the well-preserved weights of 3.0 g and 1.6 g from Kaupang belong to the same system, but were calibrated against slightly different objects. Assuming that the maximum number of punchmarks on one square side is significant, it is noteworthy that the largest weight has twice as many dots on its square sides and is double the weight of the smallest. This seems to suggest that the marking could refer to the actual weight. Like the group of weights around 3.5 g, these weights suggest, then, that the marking was standardized. If the dots refer to the weight of the objects these weights were calibrated against, it implies objects of 0.75–0.80 g. Steuer (1987:abb. 15) has demonstrated that all the best preserved weights at Hedeby are multiples of 0.355 g. Isolating some of the best preserved weights presented by Steuer, three weights of c. 1.42 g, 2.84 g and 4.266 g seem to correspond to the two Kaupang weights. These Hedeby weights are marked with 2, 4 and 6 punchmarks respectively, which could refer to the multiple of 0.71 g they represent. The variety at Kaupang and Hedeby nevertheless demonstrates that the system behind the marking is complex. The meaning of the regularities and their deviations is not obvious and will need to be substantiated by comparison with punchmarks on the lead weights.

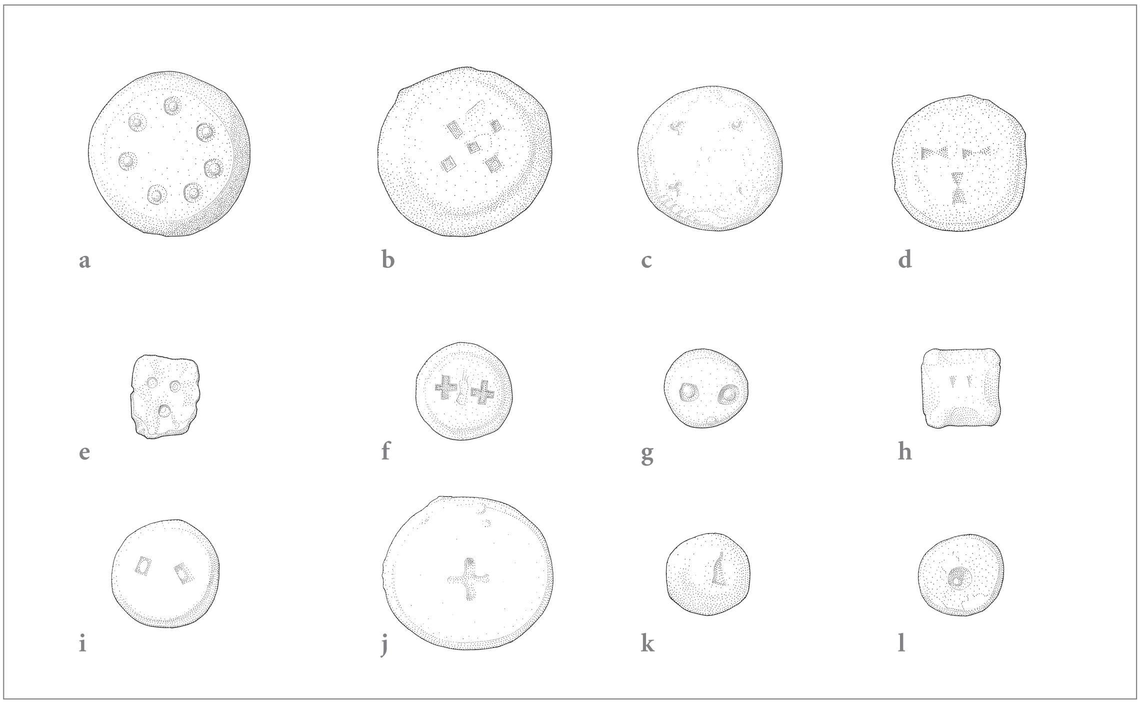
The punched-dot decoration found on a total of 43 lead weights is much more heterogeneous and appears more individualized (Figs. 6.5, 6.22–6.23, Tab. 6.13, Appendix 3). There is a much wider range of punchmarks documented: circles, triangles, rectangles, crosses etc. The punchmarks are also placed in a less regular manner. However some of these weights, too, are both similar in the type and number of the dots and in weight. Most of the punched-dot decorated lead weights are cylindrical, but conical, biconical and rectangular weights are also marked this way. Amongst all lead weights, regardless of marking, 28% of the biconical, 16% of the conical and 15% of the cylindrical lead weights have punched-dot decoration. It is especially noteworthy that the biconical weights are over-represented in this way, as this is the type of weight that is best adjusted towards the multiples of four grams. Considering the size of the well-preserved weights, the sample is otherwise a representative cross-section of the lead weights from the site (Fig. 6.19). There is no tendency for the þveiti/ertog/øre-weights to be over-represented or vice ver-

Museum no.	Decoration						Weight	
	Dot	Total	■	▲	Beaded border	Quality	g	Alteration
C53160/7	⊙	36 + 8	6	1	Y/Y	A	3.539	Little
C52517/1006	⊙	36 + 8	6	1	Y/Y	B	3.171	Some
C52517/2621	◎	36 + 8?	6	1	?/?	C	3.307	Some
C52519/15035	⊙	36 + 8?	6	1	Y/?	B	2.805	Some
C52517/1707	⊙	36	6	-	Y/N	A	3.47	Some
C52517/2561	⊙	36	6	-	Y/Y	B	2.88	Some
C52517/2153	⊙	36?	6	?	Y/?	C	3.263	Some
C52517/2291	⊙	36?	6	-	Y/N	C	1.998	Much
C52519/13888	⊙	36?	6	-	N/N	B	2.99	Some
C52517/2548	⊙	36?	6	?	Y/?	C	2.93	Much
C52517/1930	⊙	36?	6?	?	?/?	C	2.521	Much
C52519/18388	⊙	24? + 8?	4	1	Y/N	B	1.13	Much
C52517/2523	○	24	4	-	N/N	A	3.038	Little
C52517/1999	⊙	24?	4	?	Y/N	C	3.047	Some
C52519/14336	⊙	12	2	?	Y/N	C	1.066	Much
C52519/15175	⊙	12	2	-	Y/N	B	1.17	Some
C52517/51	⊙	12?	2		N/N	B	1.624	Some
C52517/1976	⊙	12?	2	-	Y/N	C	0.88	Much
C52517/761	⊙	12?	2	-	Y/N	B	0.878	Much
C52517/507	○	9?	2/1	-	N/N	B	1.558	Little
C52517/1945	⊙	?	6?	?	Y/?	D	2.486	Some
C52517/783	○	?	1?	?	?	D	0.778	Much
C52517/317	⊙	?	>3?	?	?	D	3.154	Much
C52517/1664	⊙	?	2?	1?	?	D	2.315	Some
C52517/280	⊙	?	>2?	?	?	D	1.899	Much
C52517/169	?	?	?	?	?	D	2.973	Much
C52517/1952	?	?	?	?	?	D	2.54	Much
C52517/2162	⊙	?	?	?	?	D	2.162	Much
C52517/2691	⊙	?	?	?	?	D	2.096	Much

Table 6.11 *Cubo-octahedral copper-alloy or copper-alloy/iron weights from the settlement with punched-dot decoration. ■ = Number of dots on each of the six square sides. ▲ = Number of dots on each of the eight triangular sides. Y/Y = beaded border ■ and ▲ Y/N = beaded border ■ Quality = the preservation of the decoration: A = well-preserved on all sides; B = well-preserved on some sides; C = identifiable; D = incomplete.*

Museum no.	Decoration					Weight	
	Dot	Total	■	▲	Quality	g	Alteration
C53160/7	⊙	36 +8	6	1	A	3.539	Little
C52517/1006	⊙	36 +8	6	1	B	3.171	Some
C52517/2621	◎	36 +8?	6	1	C	3.307	Some
C52519/15035	⊙	36 +8?	6	1	B	2.805	Some
C52517/1707	⊙	36	6	-	A	3.47	Some
C52517/2561	⊙	36	6	-	B	2.88	Some
C52517/2153	⊙	36?	6	?	C	3.263	Some
C52519/13888	⊙	36?	6	-	B	2.99	Some
C52517/2523	○	24	4	-	A	3.038	Little
C52517/1999	⊙	24?	4	?	C	3.047	Some
C52519/15175	⊙	12	2	-	B	1.17	Some
C52517/51	⊙	12?	2	-	B	1.624	Some
C52517/507	○	9?	2/1	-	B	1.558	Little

Table 6.12 *A selection of the best preserved cubo-octahedral copper-alloy weights (Tab. 6.11).*



sa. With a few exceptions the lead weights are decorated on only one side and the total number of dots is therefore considerably lower than on the cubo-octahedral weights. The number of dots on any one face is roughly in the same range for both groups, supporting the suggestion made above that it is the number on one side, not the total of punchmarks, that is relevant with the cubo-octahedral weights. Unlike the cubo-octahedral weights at Kaupang, both even and odd numbers are represented on one side, in an unbroken series from 1 to 5 and then with 7 as the maximum. Five punchmarks, not found on cubo-octahedral weights from Kaupang, Hedeby or Birka, are documented in three cases, implying certain differences in marking between the lead weights and the cubo-octahedral weights.

The lead weights are much better preserved and only one is so altered that it is misleading to draw its original weight into discussion. Compared to the cubo-octahedral weights there is a similar tendency towards more dots on heavier weights, but there is considerable lassitude in the relationship between weight and number of punchmarks. For instance 3 dots are found on weights of 1–32 g, while 1 dot is found on weights from 1–27 g (Tab. 6.13). There are nevertheless some weights of a similar size with the same number of punchmarks. In the group with 1 dot there is a cluster around 4 g, amongst the weights with 2 dots a cluster around 8 g, and in the group with 3 dots a cluster around 23 g. If the group around 23 g is related to the þveiti/ertog/øre-system, the 3 dots could refer to the 3 ertogs of c. 8 g. The 2 dots on the 8 g weights could, on the other hand, refer to these weights being two þveiti of c. 4 g, the most frequent size found at Kaupang. The latter interpretation would be valid for the 4 g weights with 1 dot too. There thus seem to be reasons to regard the þveiti as a unit of its own, and not just as a fraction of the ertog.

With these observations as a point of departure, the weight of each individual weight has been divided by the number of punchmarks (Tab. 6.13). Allowing for the same variation as witnessed by the main concentration of the weights in Figure 6.18,[55] it is quite clear that the punched-dot decoration represents considerable regularity. Once again the þveiti-unit of c. 4 g stands out clearly as the most prominent size. A total of 12 weights (28%) are marked as multiples of þveiti; 1, 2, 3, 4, 5 and 7 respectively. Moreover it is even possible that its multiple of 6 is present too, as one weight is marked with three hour-glass shaped punchmarks which could be interpreted as 6 dots. The ertog of c. 8 g is also frequent, represented by nine or ten weights (23%) including the weight just mentioned and otherwise in multiples of 1, 2, 3, 4 and 5. The early half-øre of c. 12 g is represented by three weights (7%), while one weight with 1 dot might refer to the early øre of c. 26 g. More than half of the marked weights thus seem to refer to the þveiti/ertog/øre-standard, but in three different ways – pointing to the þveiti, the ertog and the half-øre as bases respectively. The majority of the punched-dot decorated lead weights thus seem to refer to sizes that are generally well represented amongst the weights from the site. These weights could not otherwise be distinguished from each other by their general shaping, the type of punch used, or size. This seems to

55 2 g (± 0.2), 4 g (± 0.25), 8 g (± 0.3), 12 g (± 0.3) and 24 g (± 0.5).

Figure 6.22 *Punched-dot decoration on a selection of lead weights.* ***a.*** *C52517/153,* ***b.*** *C52517/935,* ***c.*** *C52517/2182,* ***d.*** *C52517/2067,* ***e.*** *C52517/2698,* ***f.*** *C52519/9376,* ***g.*** *C52519/14049,* ***h.*** *C52517/1923,* ***i.*** *C52517/2448,* ***j.*** *C52517/2335,* ***k.*** *C52517/990,* ***l.*** *C52517/916. Scale 1:1. Drawings, Bjørn-Håkon Eketuft Rygh.*

Figure 6.23 *A selection of punched-dot decorated weights. Photo, Eirik Irgens Johnsen, KHM.*

suggest that these three sizes were regarded as three different units, but presumably within the same system – as weights of equal heaviness could refer to different units.

Despite the differences already noted – like the much more individualistically shaped punchmarks – the markings of these Þveiti, ertog and half-øre multiples of lead thus seem to have much in common with the markings of the cubo-octahedral copper-alloy weights. As with the well-preserved cubo-octahedral copper-alloy weights at Hedeby, discussed above, the dots seem to refer to the times a common factor is multiplied (Steuer 1987:abb. 15). In contrast to the cubo-octahedral weights, the common factor of the lead weights differs dramatically, but the possibility that the punchmarks refer to units of different sizes could explain the observation above that cubo-octahedral weights of different sizes have the same number of punchmark on their square sides.

The difference between the units the punchmarks refer to is even more pronounced if the lead weights that might refer to the smallest common denominators are drawn into discussion. Three weights refer to remarkably small unit(s) – between 0.3 and 0.83 g. It is possible that my interpretation can be questioned in the case of the smallest, a weight of 1.15 g, with 3 dots, with no close parallels (Fig. 6.22.e). It is nevertheless noteworthy that 0.355 g is a unit that is observed amongst the cubo-octahedral copper-alloy weights from Hedeby (Steuer 1987:463). The other two (of 1.29 and 1.65 g respectively), decorated with 2 punchmarks each, have some parallels amongst the lead weights with 2 dots at Birka, at 1.33–1.69 g (Sperber 2004:List 7).

There are also a few well-preserved weights that appear to be multiples of other units (1.48, 3.56, 3.64, 4.96, 6.76, 8.53 and 10.70 g). These, however, are sizes that are less pronounced amongst the weights themselves. This could indicate that the markings of these weights are individual. Viewed in the light of the group as a whole, it is equally likely, however, that these are units we now have difficulty identifying.

What is clear is that the common denominator of 1.3 g suggested by Steinnes for the sets from Sævli and Jåtten is missing – and likewise the grain of c. 0.067 as emphasised by Kilger (this vol. Ch.8:314). As discussed above, 1.3 g is equal to the weight of a tremissis,

Museum no.	Weight-type	Decoration			Weight			Suggested interpretation	
		Dot	Total	Per side	Quality	g	Alteration	Multiple of	Unit
C52517/471	Cylindrical	⊡	(7)	(4) +(3)	D?	38.51	Much	-	-
C52517/153	Cylindrical	⊙	7	7 x 1	A	26.51	Little	3.79	Þveiti x 7
C52517/818	Cylindrical	□	5	5 x 1	A	37.96	Some	(7.59)	Ertog(?) x 5
C52517/935	Biconical	□	5	5 x 1	A	37.55	Some	(7.51)	(Ertog?) x 5
C52517/316	Cylindrical	Irreg.	5	5 x 1	A	18.71	Little	3.74	Þveiti (?) x 5
C52105a	Conical	Irreg.	5	5 x 1	B	17.8	Some	(3.56)	(Þveiti?) x 5
C52517/2386	Conical	Irreg.	4 (3)?	(4? x 1)	D?	34.54	Some	-	-
C52517/1923	Rectangular	▲	4	2 x 2	C	7.12	Little	3.56	
C52519/14053	Biconical	□	4 (3?)	4 x 1	A	15.84	Little	3.96	Þveiti x 4
C52517/685	Biconical	○	4 (3?)	4 x 1	C?	31.4	Little	7.85	Ertog x 4
C52517/2182	Cylindrical	⅄	4	4 x 1	C	19.82	Little	4.96	
C52517/1043	Cylindrical	○	3	3 x 1	A	32.11	Little	10.70	
C52519/15946	Cylindrical	▲	3	3 x 1	A	24.35	Little	8.12	Ertog x 3
C52517/433	Cylindrical	○	3	3 x 1	A	23.17	Little	7.72	Ertog x 3
C52517/2077	Cylindrical	○	3	3 x 1	A?	22.12	Some	(7.37)	Ertog (?) x 3
C52517/2067	Cylindrical	⧗	3 (6)	3 (6) x 1	A	22.33	Some	(7.44/3.72)	(Ertog?) x 3 / Þveiti x 6
C52517/1936	Cylindrical	○	3	3 x 1	A	11.26	Little	3.75	Þveiti x 3
C52517/2051	Cylindrical	○	3	3 x 1	A	10.91	Little	3.64	
C52516/3770	Cylindrical	○	3	3 x 1	A	9.15	Some	(3.05)	
C52517/2698	Plate-shaped	○	3	3 x 1	A	1.15	Little	0.38	
C52517/449	Cylindrical	▲	2	2 x 1	C	23.78	Little	11.89	½ øre x 2
C52517/856	Cylindrical	Irreg.	2	2 x 1	A	16.44	Little	8.22	Ertog x 2
C52517/982	Oblate sph.	○	2	2 x 1	C	15.48	Little	7.74	Ertog x 2
C52517/2096	Cylindrical	▲	2	2 x 1	A	13.89	Some	(6.95)	
C52517/2448	Cylindrical	⊡	2	2 x 1	C	10.93	Some	(5.47)	
C52517/315	Cylindrical	⊡	2	2 x 1	A	8.88	Little	4.44	
C52517/1989	Conical	⊙	2	2 x 1	A	8.07	Some	(4.04)	Þveiti (?) x 2
C52517/794	Conical	○	2	2 x 1	A	7.97	Little	3.99	Þveiti x 2
C52519/9376	Cylindrical	✚	2	2 x 1	A	7.93	Little	3.97	Þveiti x 2
C52517/2419	Conical	Irreg.	2	2 x 1	C	7.74	Some	(3.87)	Þveiti x 2
C52517/1681	Conical	⊙	2	2 x 1	A	6.68	Some	(3.34)	
MO60IV yy	Cylindrical	○	2	2 x 1	A	1.29	Little	0.65	
C52519/14049	Cylindrical	⊙	2	2 x 1	A	1.65	Little	0.83	
C52517/2335	Cylindrical	+	1	1 x 1?	B	27.01	Little	=	1 early øre(?)
C52517/1688	Cylindrical	⊙	1	1 x 1?	A	11.55	Little	=	(½ øre?) x 1
C52517/1538	Biconical	⊙	1	1 x 1	C?	10.28	Some	(=)	(½ øre?) x 1
C52517/2202	Cylindrical	○	1	1 x 1	A	8.53	Little	=	
C52517/278	Cylindrical	○	1	1 x 1	C	8.24	Little	=	Ertog x 1
C52517/990	Conical	▲	1	1 x 1	A	6.76	Some	(=)	
C52517/617	Cylindrical	○	1	1 x 1	A	4.13	Little	=	Þveiti x 1
A65IV p	Biconical	○	1	1 x 1	A	4.02	Little	=	Þveiti x 1
C52517/916	Cylindrical	⊙	1	1 x 1	A	3.81	Little	=	Þveiti x 1
C52517/443	Cylindrical	○	1	1 x 1	A	1.48	Some	(=)	

Table 6.13 *All lead weights with punched-dot decoration. Quality = the preservation of the decoration: A = well-preserved on all sides; B = well-preserved on some sides; C = identifiable; D = incomplete.*

which Kyhlberg and Kilger have suggested as the calibration prototype of Viking-period weights, and a unit that would have been useful in the calibration of most of the lead weights from Kaupang (above, 6.3.3). This could imply that the identification of 1.3 g as a size used for the calibration of weights is wrong, but it is also possible that it shows that calibration and weighing are two different aspects of the use of weights, relevant to different categories of user. With the strong resemblance in sizes characterizing the corpus of weights from Kaupang, it seems highly likely that the punched-dot decoration primarily illustrates how weights were handled in practice when weighing at Kaupang. The majority of the weights then referred to a given number of þveiti, ertog or half-øre.

The punchmark may refer to the size of load that a weight-set was intended for. Steuer (1987:467) has suggested that the cubo-octahedral copper-alloy weights were intended for the weighing of small amounts (of gold) while the oblate spheroid weights were for larger loads (of silver) (see also Kilger, this vol. Ch. 8.5). As demonstrated by Steuer (1987:abb. 15–6), the number of dots on the individual sides of the weight-types are roughly the same, even though the weights are of widely different sizes. It is thus possible that the markings of both these weight types and the lead weights refer to how precisely a weight(-set) was calibrated. In sum, the punched-dot decoration on most (or all?) of the weights seems to be a marking of units in a standardized way, but able to refer to several different units. When it comes to the lead weights, an individual way of shaping the marking was nevertheless allowed for within the standard. Whether the different units were marked the same way at the same time or at different times is indeterminable from the Kaupang material.

Only 13% of the lead weights from Kaupang were marked with punchmarks. This could suggest that no more than one or a few weights within each set were marked. In the Jåtten set, for instance, no weights are decorated with dots. On the other hand all the cubo-octahedral copper-alloy weights are marked in this way. Gustin (2004c:242–4) has emphasised the need for trust in trade, and has regarded the strict regulation of the cubo-octahedral copper-alloy weights and the spheroid copper-alloy/iron weights as an indication of the superiority of these weights in trading. Seen in the light of the strong (lead) weight-tradition in Scandinavia, and the adjustment of most lead weights from Kaupang, it could just as well have been the other way around – that the new and foreign weights had to prove themselves trustworthy while the traditional way of weighing was more readily accepted.

6.4 The weights – function and meaning

As illustrated by the discussion to this point there is little reason to doubt that Viking-period weights and balances were highly functional. What types of activities they were used in has, however, been an issue of debate during the past decade (Steuer 1987; Feveile 1994; Steuer 1997; Gustin 1998, 1999; Pedersen 2000; Pedersen, U. 2001; Steuer et al. 2002; Gustin 2004c: 106–12). In this section, functional and symbolic aspects of Viking-age weights will be explored on the basis of the Kaupang finds. The limited material from stratified Viking-age contexts does not permit far-reaching conclusions but, analysed together with the Norwegian grave finds, the Kaupang weights can shed light upon some situations that weighing equipment was involved in. The point of departure for the discussion is the spatial distribution of the weights in the settlement.

6.4.1 The spatial distribution of weights in the settlement

Weights were found over much of the accessible area during the surface surveys (Fig. 6.24). In essence, the distribution of the weights follows the general distribution of finds from the surface surveys, with a main concentration in the central area. The total lack of weights in the south-westernmost part merely reflects the fact that no metal-detecting was undertaken there. A considerable degree of down-slope displacement is expected in the modern ploughsoil due to ploughing (Pilø 2007b:144–5), but generally the most considerable movement of artefacts is observed down the slope towards the harbour, to the south-east. Thus the distribution throughout the length of the settlement from south-west to north-east probably shows that weights were used over much of the settlement area. The question of whether or not these ploughed up weights were used in different areas at the same time will remain unanswered, but it is noteworthy that different types of weight are widely distributed, including the oblate spheroid weights and the cubo-octahedral weights which post-date AD 870/880 and AD 860/870 respectively. It does not seem likely the weights from the surface surveys originate from one restricted area and phase, like the large collection of lead weights in the workshops at Birka (Gustin 2004c:94).

Even weights of different types are distributed in most parts of the settlement, indicating a general use of weights of lead as well as the oblate spheroid and cubo-octahedral weights. A few distinctive patterns nevertheless seem to reflect specific activities. With two exceptions, the south-westernmost part of the settlement has not got weights of copper alloy(/iron) over a length of about 150 m. This area will be discussed in section 6.4.2, below, along with the area east of the MRE with a concentration of cubo-octahedral copper-alloy weights. Moreover the distribution map

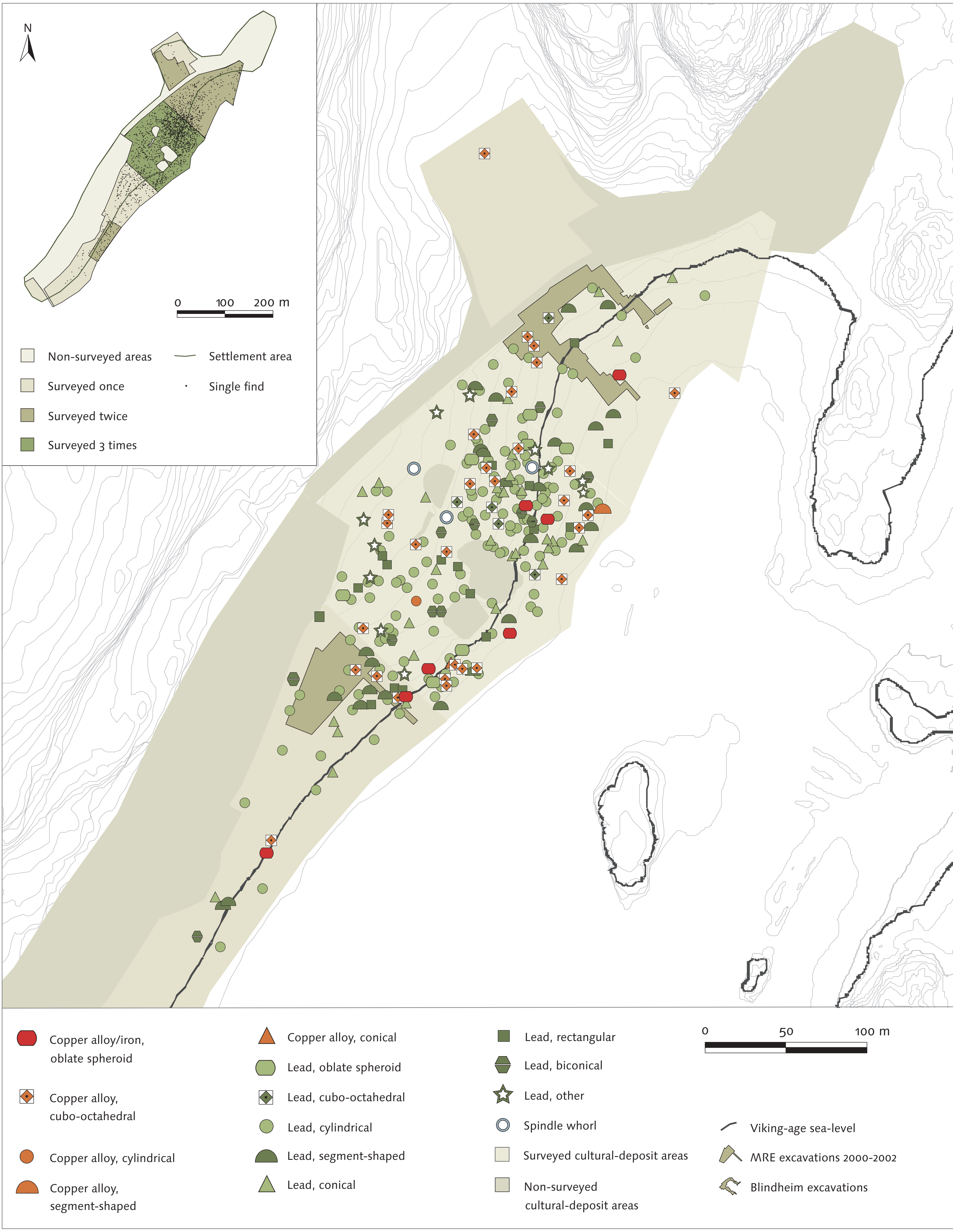

N
0 100 200 m
Non-surveyed areas
Surveyed once
Surveyed twice
Surveyed 3 times
Settlement area
Single find
Copper alloy/iron, oblate spheroid
Copper alloy, cubo-octahedral
Copper alloy, cylindrical
Copper alloy, segment-shaped
Copper alloy, conical
Lead, oblate spheroid
Lead, cubo-octahedral
Lead, cylindrical
Lead, segment-shaped
Lead, conical
Lead, rectangular
Lead, biconical
Lead, other
Spindle whorl
Surveyed cultural-deposit areas
Non-surveyed cultural-deposit areas
0 50 100 m
Viking-age sea-level
MRE excavations 2000-2002
Blindheim excavations

Figure 6.24 *Spatial distribution of weights from the surface surveys. Map, Elise Naumann and Unn Pedersen.*

seems to suggest that the assumed local production of cubo-octahedral lead weights could have been the result of production in a hypothetical workshop or workshop area. Three of these five weights cluster and a fourth weight was found along their north-west/south-east axis, which thus could have been moved further down the slope from the same area by later ploughing. Three possible weights in the form of fragmented spindle-whorls (above, 6.1.3) are also found in the central area of the settlement, but their location neither confirms nor challenges the interpretation of the object as a weight. Such is the case with the spindle-whorl found in the MRE (Fig. 6.27).

In addition to the surface surveys, the CRM trenches, although narrow, cover different parts of the settlement area. The nine weights from the CRM outside the area of the MRE have a quite dispersed distribution (Fig. 6.25). Three were found south-west of the MRE trenches, one in the fill of a pit,[56] and two in a well.[57] In both cases it is impossible to ascertain whether the weights belonged to the fill of the feature or a later plough-layer sunken into it. North of the MRE a weight was found in a post hole of probable Viking-period date.[58] Four weights were found within 50 m north-east of the 1957–1974 excavation trenches, one in a structure interpreted as a Viking-period plot-boundary,[59] one in a layer of the Viking Period,[60] one in a structure of uncertain date,[61] and one in the later medieval plough-layer.[62] Finally, another 70 m north-east a weight was found in the later medieval plough-layer.[63] The single weight found during the harbour excavation was in a midden layer deposited below the Viking-period sea-level.

The weights from Blindheim's excavations are also widely scattered. Of the 31 weights, four were from the excavation trench but without contextual information, while one was found in a test pit in the slope north of the excavation area. A reinterpretation of the structures from Blindheim's excavation identifies her masonry building remains as plot divisions towards the harbour (Pilø 2007c:169). The spatial distribution of weights in the trench (Fig. 6.26) points to the use of weights over much of the excavated area, as weights are present on all the different plots in the area. However, the eleven weights with recorded stratigraphical information were all related to the so called "Black Earth layer" corresponding to the later medieval plough-layer. Some of the weights may have belonged to preserved Viking-period layers, but this is no longer verifiable as the deposits were removed in spits (Pilø 2007a:133). Again, the overall picture could represent a long period of time.

A similarly wide distribution characterizes the 50 weights found during the excavations in the modern ploughsoil of the MRE and connected areas of the CRM (Fig. 6.27). Like the material from the surface surveys, the weights may in theory belong to activity from SP I to SP III (above, 6.2.1). The complete lack of weights of copper alloy/iron is striking. As this weight-type was found both during the metal-detector campaign and in the later medieval plough-layer right below, this probably reflects a failure to identify these weights on a purely visual basis (above, 6.1.3). This is further supported by the fact that two of the three weights of copper alloy/iron from the later medieval plough-layer first were identified by x-radiography. It is likely that the weights in the modern

56 A12794.
57 A1635.
58 A3549.
59 A3315.
60 A4360.
61 A27825.
62 A1021858.
63 A1112.

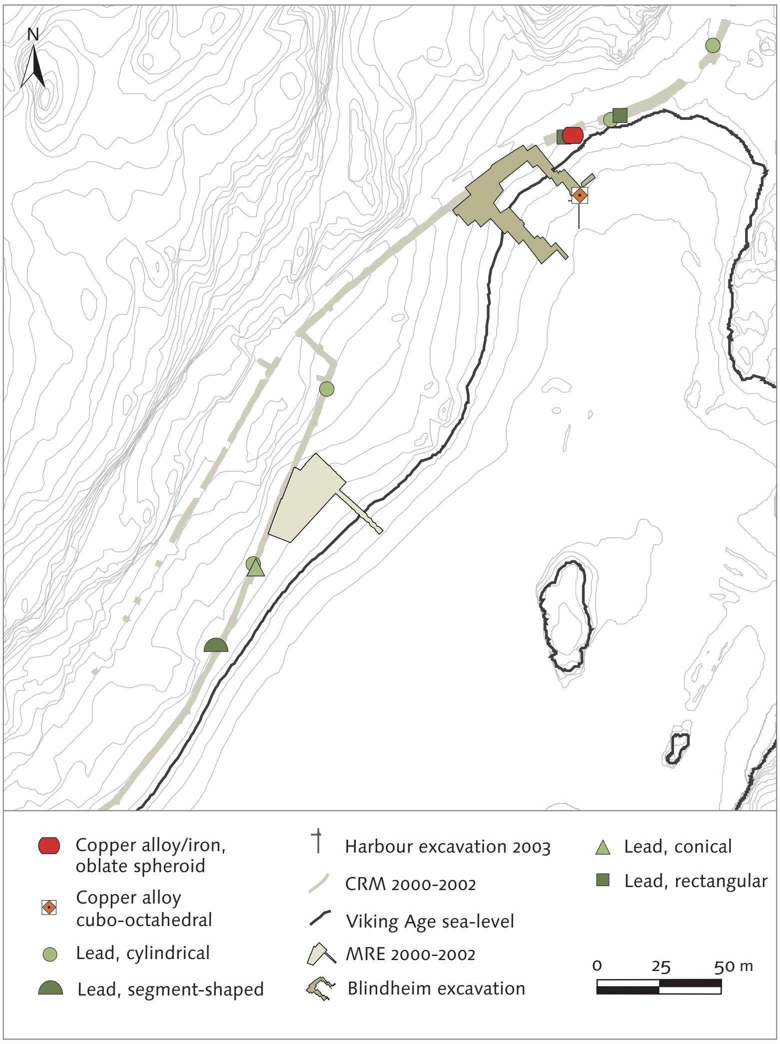


Figure 6.25 *Spatial distribution of weights from the harbour excavation and the CRM excavation outside the area of the MRE trench. Map, Julie K. Øhre Askjem, Elise Naumann and Unn Pedersen.*

Figure 6.26 *Distribution of weights from Blindheim's excavations. The weights are located within squares of 2 x 2 meters. Hatched areas indicate less presice location of three weights. Map, Elise Naumann and Unn Pedersen.*

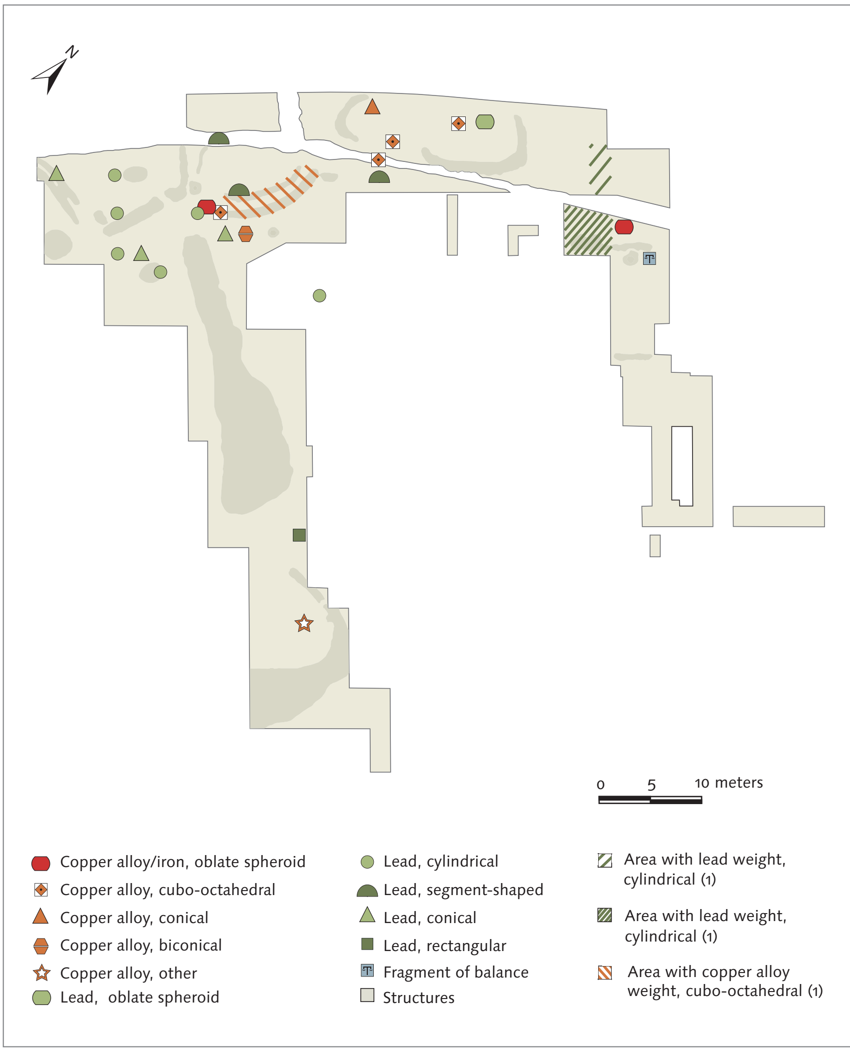
plough soil are even more corroded because of the more unstable environment and repeated ploughing.

In the MRE trench and connected areas of the CRM, a total of 24 weights derive from the later medieval plough-layer (Fig. 6.27). These too reflect quite a wide distribution and use of weights. However, compared with the distribution in the modern ploughsoil above, the weights are basically concentrated towards the plots. Just one weight was found above the midden area towards the harbour in the south-easternmost part of the trench, although the later medieval plough-layer covered considerable parts of the midden area (Pilø 2003:fig. 4.45). Likewise all the four weights from SP III, one weight from SP I–III on Plot 3B, and two weights dated by type to the later part of SP I–III, are located at the plots where they are distributed from south-west to the north-east (Fig. 6.27). The spatial distribution in SP II is rather different, as a single weight was found on Plot 1A while the other four all belong to two minor concentrations on Plots 3A and 3B. The concentration at Plot 3A and 3B could be from activities that are roughly contemporary. The weight with a uncertain SP II date is located at Plot 2A, close to the weights at Plot 3A. The situation in the latter part of SP II is perhaps a better illustration of the degree of destruction by ploughing in the MRE than it is of the situation in the second quarter of the 9th century. Judging from Plots 3A and 3B, the use of weights first increased towards the end of SP II sub-phase 2, and this phase has been completely ploughed away at Plots 1A and 1B.

A comparison between SP II and the overlying later medieval plough-layer gives an almost overlapping concentration at Plot 3A, in both layers constituted by lead weights. This could indicate that lead weights were used in the same area in the following period too, where the stratified deposits are disturbed by the plough. The second half of the 9th century probably saw continued permanent settlement at Kaupang (Pilø 2007d:202). However, two of the lead weights at Plot 3A were found in the post-Viking-age road associated with the later medieval plough-layer. Judging from the description of the layer[64] in the excavation documentation (Pilø 2003:136), it is possible that deposits from the later part of SP II were disturbed during the digging of the later medieval plough-layer above.

The clearly limited amount of weights from SP II may reflect the limited use of weights in the second quarter of the 9th century, but could equally reflect the very careful keeping of weights. The latter seems to be supported by the fact that no weights were found during the extensive excavations in the midden area towards the harbour. Looked at more closely, the distribution of weights in the preserved Viking-age deposits shows a strong concentration towards the areas of buildings. The weight on Plot 1A was found in an activity layer beneath the wall bench of building A200, while one weight from Plot 3A was found in the activity layer belonging to the first phase of building A302[65] (Fig. 6.28). The other weight on Plot 3A is from a layer deposited after the building was taken or had fallen down, but it was nevertheless situated in the area of the buildings (Fig. 6.28). Likewise the two weights from Plot 3B were found in layers right above building A301 (Fig. 6.28). Even the weights from these layers could have been re-deposited from the layers originally belonging to the buildings.

The Kaupang material is limited, but Mats Roslund's (1995) analyses of the distribution of weights and silver in Sigtuna AD 980–1250 seem to give a similar picture with a larger data set. Roslund demonstrated that weights and coins were much more abundant in the area of the residential buildings than in the workshop area facing the street. A large proportion of the weights were, moreover, found in the interior of the houses. This led Roslund (1995:156) to conclude that most of the weighing of silver in the form of coins took place in the private part of the town. Correspondingly, the small buildings at Kaupang were probably domestic houses, albeit with some elements of craft production (Pilø 2007d: 203–11). There are several differences in character between Sigtuna and Kaupang, but the restriction of weights to residential buildings may still be relevant. Even the weights found in the purse from a burnt house in Birka (Gustin 2004c:94), seem to suggest that weights were used indoors, or at least kept indoors in the earlier part of the Viking-period. Jon Anders Risvaag (2006) has, however, demonstrated that the so called Library Site in Trondheim has a quite different spatial distribution of coins in the period AD 1050–1100. The coins there had a distinct distribution along the main passage *Kaupmannastretet.* The coins were found in connexion with the street, with some inside the workshops and shops facing it, while only one coin was found in the dwelling houses behind (Risvaag 2006:133–5). Risvaag suggests that the difference between Trondheim and Sigtuna could be explained by better cleaning of the houses in Trondheim, or by a more archaic form of trade at Sigtuna as the coins there were older and foreign, in contrast to those in Trondheim. At Kaupang there is no indication of the weights being used in connexion with the passages, but it is possible that the small houses with some craft activities could be regarded as a fusion of the dwelling houses and the workshops and shops found in later medieval towns.

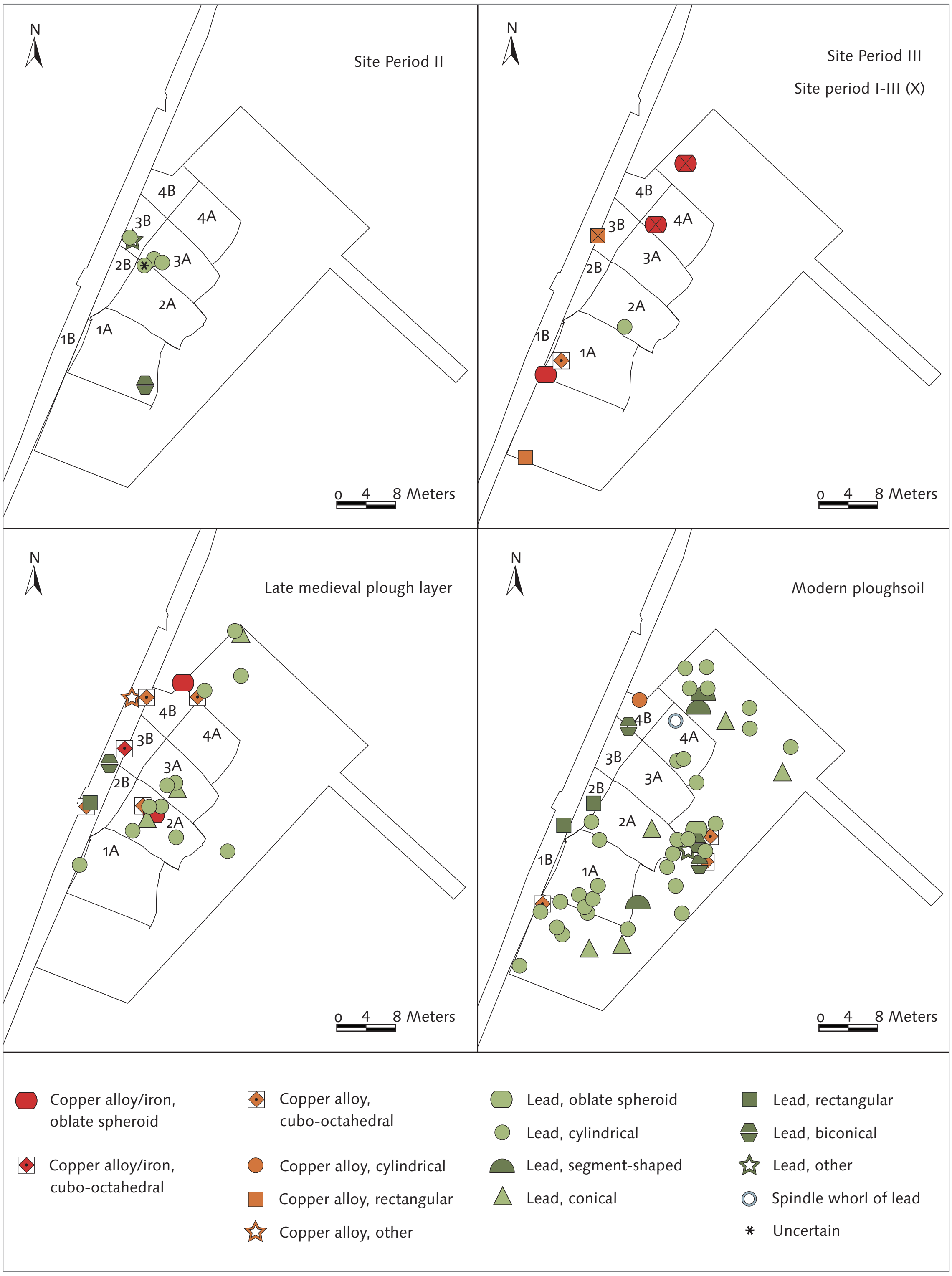


6.4.2 Tools of trade

Viking-period balances and weights have repeatedly been regarded as tools of trade for the weighing of silver as currency (Petersen 1934:42; Brøgger 1936:77; Blindheim 1956:62; Jondell 1974:3; Larsen 1986:111; Steuer 1987:405–6; Stalsberg 1991:76–7; Sperber 1996: 9–10). Persons buried with balances and/or weights are often described as traders (Brøgger 1936:77), even when their grave contains just one weight (Blindheim 1974a:74). It should, however, be borne in mind that Viking-period trading in the form of buying and

64 AL48076.

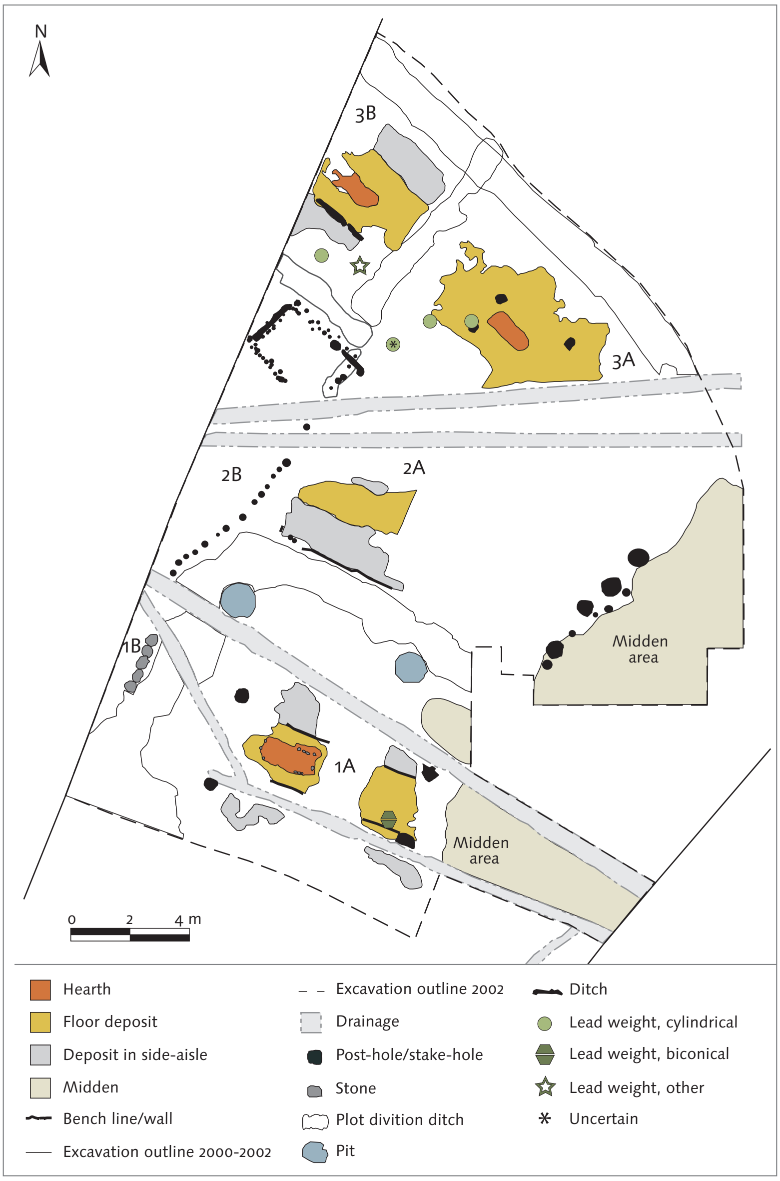
65 AL76555.



selling was one of a wide variety of forms of exchange, such as gift-giving, robbery, redistributive collection, and the collection of taxes, bails and duties – all involving precious metals (Miller 1986; Christophersen 1989a; Samson 1991; Hedeager 1993; Skre 2000). It is highly likely that weights and balances were used in several of these forms of exchange (Pedersen, U. 2001; Gustin 2004c). Arm- and neckrings of gold and silver have been interpreted as gifts used to form alliances and hierarchies (Hedeager 1999a:245–7) or as a medium for the paying of fines (Brøgger 1921:34–9). It has been demonstrated beyond doubt that such arm- and neckrings of silver and gold were adjusted according to weight, both in the Viking Period and in the preceding centuries (Brøgger 1921:29–41; Hårdh 1996:137–42). This meant that ornamented metalwork was weighed at its production and possibly even checked (in secret?) by its

Figure 6.27 *Distribution of weights by Site Periods and plough-layers. Finds from the excavations of the MRE and connected areas of CRM. Map, Julie K. Øhre Askjem, Elise Naumann and Unn Pedersen.*

Figure 6.28 *The distribution of weights of Site Period II. Illustration, Julie K. Øhre Askjem.*



new owner after being received as a gift. Due to silver's transformable quality, the socially important silver objects could be fragmented to neutral hacksilver, while fragmented silver could in turn be melted down and re-cast to form a socially meaningful gift.

The close connexion between gold and weighing equipment in the Migration Period is nicely illustrated by a hoard from Holte, Rogaland,[66] where two cylindrical lead weights were found with eight pieces of ring-money, three bracteates and a tiny globule, all of gold. As Kyhlberg (1980b:161–2) has demonstrated, the ring-money from this hoard is all well adjusted to a common factor, of which the pieces represent several different multiples. Due to the most careful handling of gold at Kaupang (Pedersen, in prep.), weighing of gold is hard to trace contextually, but the activity seems to be illustrated by an intentionally cut fragment of a gold rod (C52519/14052) found in the modern ploughsoil. This weighs 3.4 g and may thus itself have been adjusted according to weight, as it in fact represents 2½ pennings of 1.36 g.

Intentionally fragmented silver, "hacksilver", has been interpreted as a form of currency used in buying and selling (Hårdh 1996:17). Being intentionally cut, the hacksilver itself points to the use of weights and balances in transactions in which the silver was valued according to its weight. The relationship of hacksilver and weights is relatively easily explored at Kaupang, and provides a point of departure for a discussion of the use of weights and balances in trade.

The local combination of weighing equipment, intentionally fragmented silver and a wide variety of imported and locally produced goods, suggests that a considerable proportion of the hacksilver was used in local trade. The hacksilver at Kaupang is characterized by its high degree of fragmentation, indicating that even small-scale transactions involved weighed silver as the means of payment (Hårdh, this vol. Ch. 5:103). Steuer (1987:406; 1997:11) has described the economy in Scandinavia and Northern Europe east of the Elbe as a weight-money economy, *Gewichtsgeldwirtschaft,* in which silver was valued according to weight, opposed to the coin-money economy, *Münzgeldwirtschaft,* west of Elbe. In the weight-money economy there was a need for weighing equipment whenever buying and selling with silver as currency, while individual coins of a roughly equal weight were minted from a given (and weighed) amount of silver within the coin-money economy (Steuer 1987:406). In this case then, the coins could be counted when paying (Steuer 1987:406). In Steuer's works from 1987 and 1997 this interpretation is of relevance to all types of weights. More recently, in Gustin's (1997:163, 1999, 2004c) discussion of Viking-period exchange, and in Steuer et al.'s (2002: 137) latest discussion of the weights from Hedeby

66 St4547.

(with reference to Gustin), this interpretation has been reserved primarily for the so-called regulated weights, while the lead weights have been linked to metalcasting (below, 6.4.3).

Like the weights, both hacksilver and coins are predominately found in the modern or later medieval plough-layer at Kaupang (Blackburn, this vol. Ch. 3:31; Hårdh, this vol. Ch. 5:114). However, six pieces of hacksilver belong to SP II (Hårdh, this vol. Ch. 5:114), four in sub-phase 2 of Plot 3B,[67] one in sub-phase 2 of Plot 2B[68] and one in Plot 4B (Fig. 6.29). The appearance of the hacksilver thus seems to correspond well in time with the first concentration of lead weights – appearing in SP II in the second quarter of the 9th century (above, 6.2.1). The existence of hacksilver several years prior to the first appearance of regulated weights thus seems to demonstrate that even the lead weights were used for weighing silver at Kaupang, at least in an early phase of the weight-money economy as defined by Steuer (1987:406).

Judging from the spatial distribution of the hacksilver in SP II (Fig. 6.29) there seems to be a close association between lead weights and silver as currency on Plot 3B, although the material is rather limited. The only concentration of hacksilver from SP II was found in close connexion with weights as four hacksilver-fragments on Plots 3B/2B are closely related spatially to the two weights on Plot 3B. It is, moreover, possible that another three small silver fragments and seven pieces of observed silver corrosion from the phase-related contexts could have been used as hacksilver as well (Hårdh, this vol. Ch. 5:103). Three of these, a highly corroded fragment and two pieces of observed silver corrosion respectively, add to the concentration of hacksilver on Plot 3B. It therefore seems very likely that they represent the same type of activity. The silver corrosion observed in SP I and the silver on Plots 2A and 2B in SP II are, on the contrary, more probably related to casting, due to the presence of production waste (Pedersen, in prep.). There are a few finds related to casting even on Plot 3B, but they were found in such limited amounts that there is little reason to assume that casting took place on this Plot in SP II sub-phase 2 (Pedersen, in prep.). On Plot 3A there is no connexion between the weights and silver used as currency, in light of the complete lack of silver of any kind at the plot. This could, however, merely reflect more careful handling of silver than on the neighbouring plot, and does not allow any far-reaching conclusions to be drawn.

A Frankish silver coin deposited before 850 (Blackburn, this vol. Ch. 3:56) was found on Plot 4B together with a fragment of hacksilver and another silver fragment in an activity layer, possibly associated with a building. The combination of a coin and a piece of hacksilver is easily associated with the use of silver as currency, but is has been questioned whether

Figure 6.29 *Distribution of coins, hacksilver and weights by Site Periods and in the plough-layers. Finds from the excavations of the MRE and connected areas of the CRM. Map, Julie K. Øhre Askjem, Elise Naumann and Unn Pedersen.*

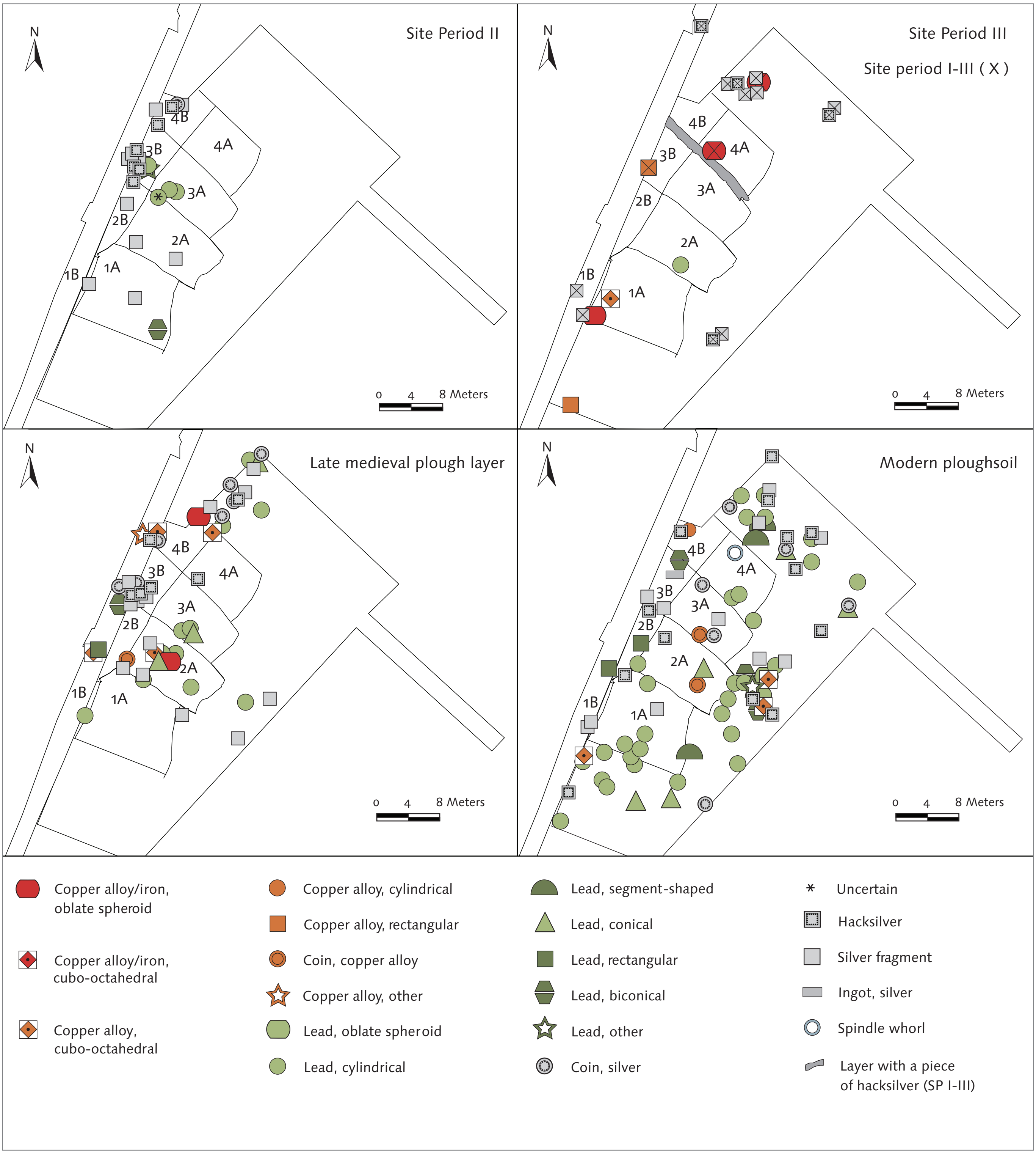
these Western coins were used as money (Moesgaard 2004. For a different view, see Skre, this vol. Ch.10: 347–8). No weights were found with this silver. Yet another silver fragment was found on Plot 4B in another layer with a possible connexion to a building. This layer is also characterized by casting waste.

With one exception, all the silver on Plot 3B is related to the area of Building A301. Thus the hacksilver, like the weights, seems to be found in connexion with the areas of dwelling houses, just like the coins and weights at Sigtuna and the purse with weights and coins at Birka (above, 6.4.1). One hacksilver-fragment belongs to an activity layer in the house, six belong to layers outside the house and two, like the weights, belong to layers accumulated after the house was gone. As Roslund (1995:155–6) has argued, this private character of transactions involving silver might imply that they had a social dimension besides their economic nature, and he suggests that a social act like handshaking or the sharing of food or a drink accompanied weighing. In this respect it is interesting that finds of vessel glass suggest that wine drinking took place in Building A301 (Gaut 2007). The importance of trust and the need for the creation of safety around economic transactions has also lately been emphasised by Gustin (2004c). In her eyes an urban site such as Kaupang was established to provide physical as well as legal protection for the traders, while trade itself was encompassed by strict routines (Gustin 2004c:242–3).

No silver belongs to SP III, but a total of five hacksilver-fragments and eight fragments or observed remains of silver are no more accurately dated than to SP I–III (Fig. 6.29). As in SP II, the hacksilver is concentrated in the north-easternmost part of the

67 AL46019, AL66841, AL62023 and AL68122.

68 AL45904.



MRE. A concentration of silver, including one fragment classified as hacksilver, was found north-east of Plot 4B along with a weight. This area is characterized by metalcasting. It is therefore possible that all the silver here, including the piece defined as hacksilver, served first and foremost as raw material for casting. A peculiar object from the metal-detector surveys (Blackburn, this vol. Ch. 3:Fig. 3.1) illustrates the interwoven character of currency and metalcasting at Kaupang. This lump, originally the contents of a crucible, shows the melting down of silver. Several half-melted, intentionally cut coin-fragments, together with intentionally cut fragments of jewellery and ingots, can be identified. It is thus quite obvious that hacksilver was reworked in the metalcasters' workshops at Kaupang. The combination is not surprising, as the capacity for remelting seems to be essential to the importance of silver in the Viking Period.

Figure 6.30 *The distribution of weights, hacksilver, silver fragments, coins and lead spindle whorls from the metal-detector campaigns, 1998–2002. Map, Elise Naumann and Unn Pedersen.*

Complete objects could easily be changed into hacksilver and vice versa.

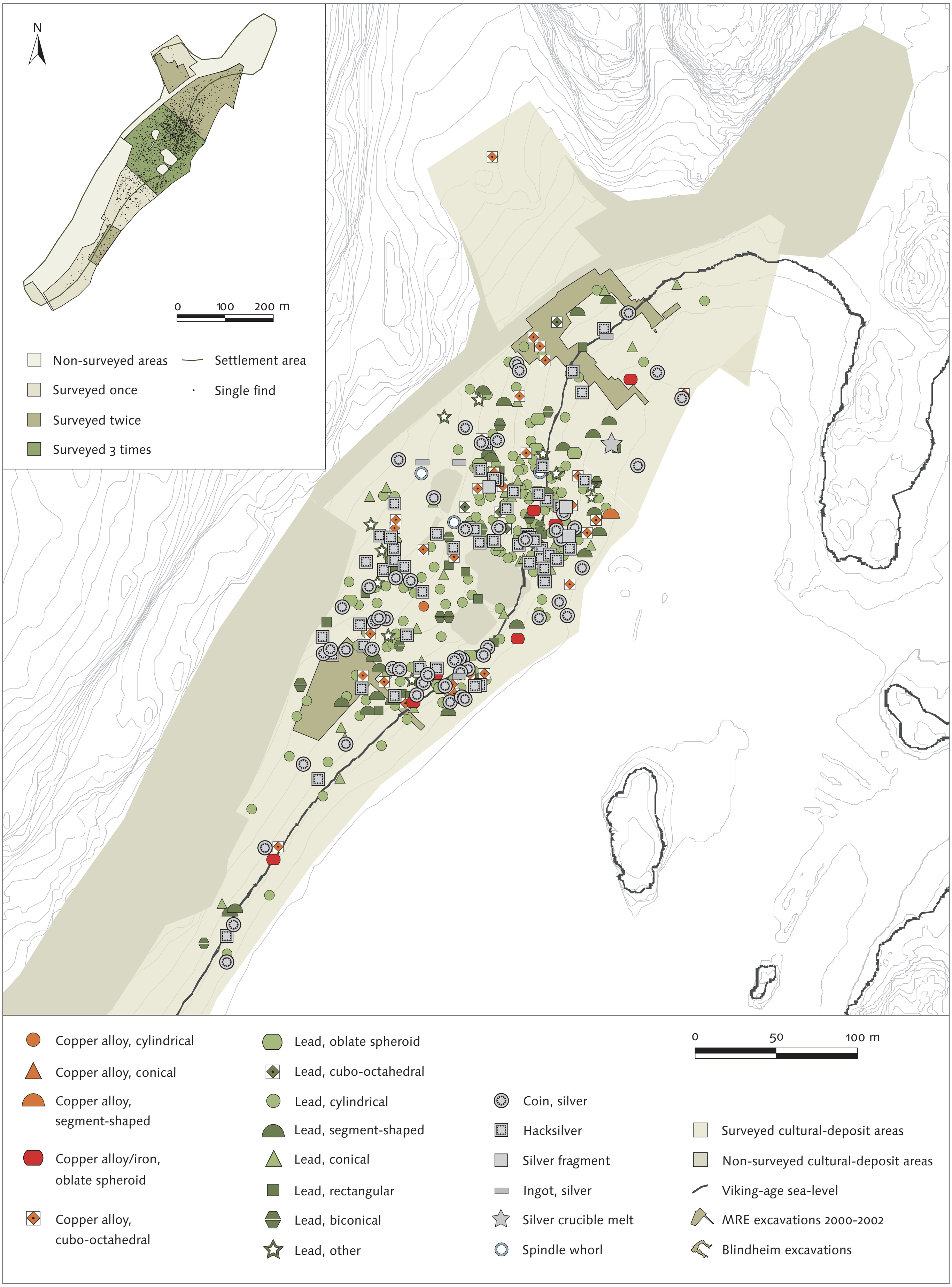
With one exception, the six hacksilver fragments in the later medieval plough-layer seem to correspond well with the concentrations of silver in SP II on Plot 3B and Plot 4B and in SP I–III north-east of Plot 4B (Fig. 6.29). As in SP II, the boundary ditch between Plots 3A/B and 2A/B represents the southernmost limit of the distribution of both hacksilver and dirhams. With the exception of a single hacksilver-fragment, all the seven silver coins and all the hacksilver were concentrated on the B-plots – if a similar plot-division is postulated to the north-east. The 13 silver fragments in the later medieval plough-layer are much more scattered, but on Plot 3B and north-east of Plot 4B they group with the hacksilver. The possible weight in the form of a Roman copper-alloy coin in the later medieval plough layer was found above Plot 2A, but its location neither confirms nor challenges the interpretation of the object as a weight. The same is the case for the two Byzantine coins found in the modern plough-layer.

Like the distribution of the weights, the distribution of hacksilver and coins from the metal-detector campaigns is widely dispersed (Fig. 6.30). It is therefore possible that the wide distribution in the modern ploughsoil of the MRE (Fig. 6.29) primarily reflects a general use of silver as well as a general use of weights. However in the modern ploughsoil in the area of the MRE some concentrations amongst the total of 6 dirhams, 13 pieces of hacksilver, and weights, seem to overlap, suggesting a relationship between the groups of artefacts. This is especially the case north-east of Plots 4A/B. Most of the hacksilver and coins were found north-east of the division between Plots 1A/B and 2A/B. Compared with the results from the metal-detector campaigns, the area south-west of this line is characterized by a very limited amount of silver: just one coin and a fragment of hacksilver were found during the MRE and only a further 5 coins and 2 pieces of hacksilver further south-west within an area of 150 m length. Thus the concentration of hacksilver and silver fragments to the north-easternmost plots observed in the preserved cultural layer seems to reflect a real difference in activities between Plots 1A/B and 2A/B on one side and 3A/B and 4A/B on the other. As demonstrated by the differences within the plough-layers, this difference was not merely the product of the assumed destruction of layers post-dating the 830/840s on the south-westernmost plots. This south-western area without silver also corresponds to the area with almost no regulated weights (above, 6.4.1). It is possible, then, that this area reflects some use of lead weights with no relation to silver currency, a situation comparable to that on Plot 3A in SP II. In the area of the small concentration of cubo-octahedral copper-alloy weights east of the MRE (above, 6.4.1), on the other hand, there are no noteworthy concentrations of silver. The area rather reflects the general distribution.

In the area excavated from 1956 to 1974 there is a wide distribution of hacksilver and coins (Fig. 6.31). Parallel with the weights, the silver is mainly concentrated on the plots, or in the area right in front of them, but a greater concentration was also found in the harbour area. The weights and the silver might, however, reflect activity over a long period of time.

Turning to other sites, *Posthus* in Ribe has 24 lead weights and c. 67 coins (mainly sceattas), but no hacksilver from the preserved phases, which end around AD 850 (Feveile and Jensen 2006:140, 143 and 145–6). At Birka 1990–1995, on the other hand, fragmented silver is present from the earliest phases, as are weights. Gustin (1998:78) has suggested that this silver might have functioned as currency, but she has emphasised that this interpretation is problematic as the silver shows a strong correspondence with deposits related to metalwork. The first stratigraphic sequence in Birka with a coin is dated to around 800, but there are only a few coins from the settlement prior to AD 900 (Gustin 2004b:98).

None of the graves from Kaupang contains coins or hacksilver, and again Kaupang's graves seem to correspond with the other graves from South-Eastern Norway where the amount of coins and hacksilver is limited. Four graves with weighing equipment contain a total of eight complete coins and a coin-fragment, and no hacksilver (Pedersen, U. 2001:20). The combination of coins and weights is also very restricted in time and space. All the finds are late 10th- and 11th-century finds from Aust-Agder. In contrast to Kaupang, 30% of Birka's graves with weighing equipment contained coins (based on Kyhlberg 1980b:294–7). However, based on a general study of the coins' contexts in Birka's graves, Kyhlberg (1980b:216) concluded that these seem to be an offering, not personal belongings like the weights.


N
0
100
200 m
Non-surveyed areas
Surveyed once
Surveyed twice
Surveyed 3 times
Settlement area
Single find
Copper alloy, cylindrical
Copper alloy, conical
Copper alloy, segment-shaped
Copper alloy/iron, oblate spheroid
Copper alloy, cubo-octahedral
Lead, oblate spheroid
Lead, cubo-octahedral
Lead, cylindrical
Lead, segment-shaped
Lead, conical
Lead, rectangular
Lead, biconical
Lead, other
Coin, silver
Hacksilver
Silver fragment
Ingot, silver
Silver crucible melt
Spindle whorl
0
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Surveyed cultural-deposit areas
Non-surveyed cultural-deposit areas
Viking-age sea-level
MRE excavations 2000-2002
Blindheim excavations

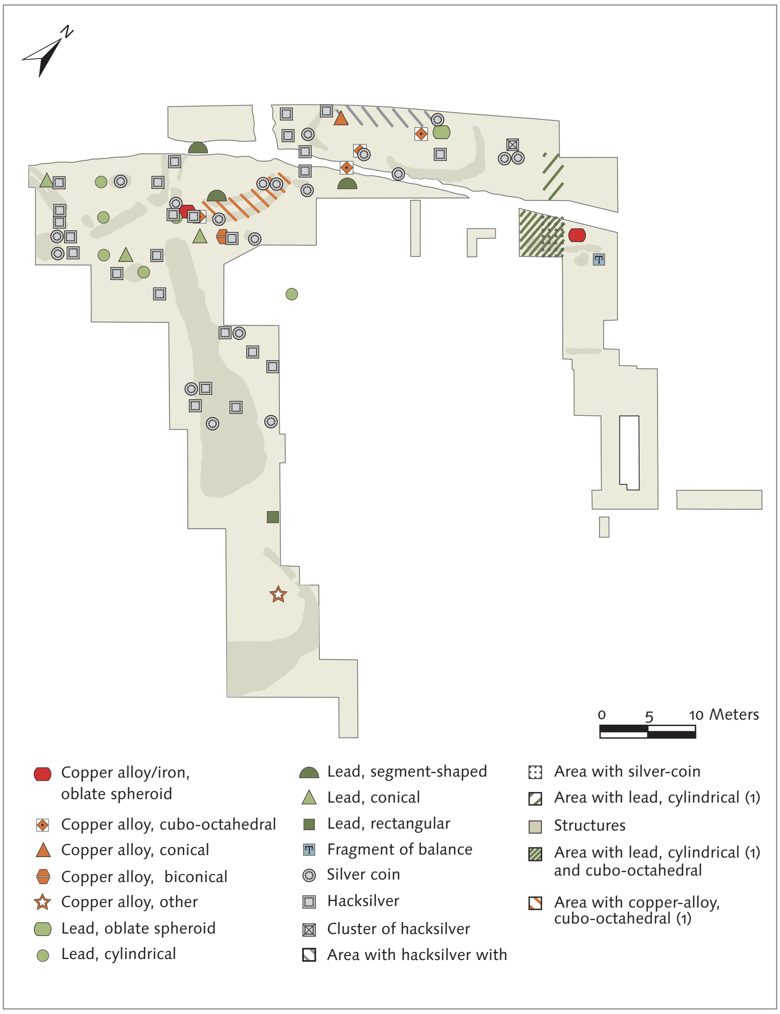


Figure 6.31 *The distribution of weights, hacksilver and coins in Blindheim's excavation of 1956–1974. Map, Elise Naumann and Unn Pedersen.*

Figure 6.32 *A soapstone mould for weights found during Blindheim's excavation in the settlement (MO60b; 8.2 x 4.9 cm). Photo, Eirik Irgens Johnsen, KHM.*

Again, then, the graves do no reflect real life. It seems that the absence of silver coins and hacksilver from most graves may reflect the fact that valuables like silver, when consciously deposited, appear primarily in hoards in this period, while the graves predominantly contain tools and personal belongings such as weights.

6.4.3 Weights and metalcasting

Ken Ravn Hedegard (1992:85) presented an alternative functional explanation of weights and balances, claiming that they were used by bronzecasters to get the right alloy. Following the finding of lead weights in bronzecasters' workshops in Birka and Ribe, Claus Feveile (1994:58; Feveile and Jensen 2006:144) and Gustin (1999:246–8) have also stressed that lead weights could be evidence of metalcasting rather than exchange. A comparable contextual relationship between lead weights and waste from casting has also been demonstrated in a rural context by Stig Jensen (1990:31), at the Viking-period magnate farm of Gamle Hviding, Jutland. Even some of the Norwegian Viking-period graves with weighing equipment contain equipment for casting in the form of moulds and crucibles (Pedersen 2000:96–7; Pedersen, U. 2001:25). At Birka, numerous lead weights, dominated by the cylindrical type, are found primarily in phases 2–5 (c. AD 750–860) in connexion with metalcasting workshops (Gustin 2004c:94–5, 311). Many of these weights could be related directly to casting through their distribution on the workshop floors or amongst workshop waste (Gustin 1999:247). These craft-related weights thus underline the importance of contextual study of the weights, and demonstrate that weights, besides being tools of trade, served other functions.

It is clear that there is a relationship between weights and non-ferrous metalwork in the Viking Age, but the explanation of this remains uncertain. The precise role of the weighing equipment in metalcasting is not discussed in Feveile, Gustin and Jensen's works. In the works of Gustin (1997), and Steuer et al. (2002) who adopted Gustin's interpretation of lead weights, the suggestion has chiefly been to exclude the lead weight from the discussion of economic relations in the Viking-period. The relationship of the weights and non-ferrous metalworking at Kaupang will be discussed in a forthcoming study (Pedersen, in prep.), but it is clear that there are no preserved Viking-period deposits with a concentration of metalworking waste and a high number of weights like at Birka. This section will address the most evident connexion between metalcasting and weighing equipment at Kaupang: the local production of weights.

In the settlement, some of the lead weights were undoubtedly miscast, while three soapstone moulds for weights testify to local weight-production (Fig. 6.32). These moulds are for cylindrical, conical and segmented weights, which are amongst the weight-types most frequently found in the settlement area. Based on the shape of the cavities alone, production of lead weights can be suggested as, with few exceptions, these types appear as lead weights. One of the cavities in one of the moulds has been analysed under SEM and remains of lead were identified (Jouttijärvi 2006; Pedersen, in prep.). One weight was also included when a series of lead artefacts were subjected to lead isotope analyses (Jouttijärvi 2006). As the weight grouped with a wide range of waste connected to leadcasting, it seems highly likely that this was a local product (Pedersen, in prep.). Production of weights and balances seems characteristic of several Viking-period urban sites. Moulds for oblate spheroid weights, massive copper-alloy weights, and copper-alloy/iron weights have been found at Birka (Söderberg 1996; Gustin 1997:170–1). Wallace (1987: 212) has also viewed the lead weights from Dublin as local products.

Weighing equipment is, in fact, essential for the production of weight-adjusted objects, such as a weight itself. Weights and a balance would also be essential to the production of other weight-adjusted objects such as ingots. In addition to the moulds for weights, a variety of moulds for ingots have been found in the settlement. Like the weights, the ingots from Kaupang are generally adjusted to standard weights (Hårdh, this vol. Ch. 5:106–7; Pedersen, in prep.).

There are, in theory, several possible models for the production of weight-adjusted objects:

1. A given amount of metal is weighed out prior to casting. It is melted in a crucible or an iron spoon and then poured into a mould of the right size or somewhat larger.
2. During the carving of the soapstone mould test castings are undertaken until the right weight is achieved. The mould is filled to the rim each time and the test weights checked with weights and balances. When the desired weight is achieved a series of weights are cast by filling the mould to the rim. During the casting:

   a. The metal is melted in a crucible or iron spoon, or
   b. The metal is melted in the mould itself
3. A mould of about the requisite size is produced and each weight is checked using a weight and balances after casting, and adjusted, if necessary, with a knife.

Judging by the soapstone moulds from Kaupang, alternative 2b is less likely, as there is no indication of any mould having been heated repeatedly. Alternative 2a is also questionable as several of the soapstone moulds have a rather irregular base. Even a minor variation in the mould would change the amount of metal that would fill the cavity. This could perhaps be corrected by holding the mould firmly, but alternatives 1 and 3 appear much more likely. Alternative 3 could be directly linked to some

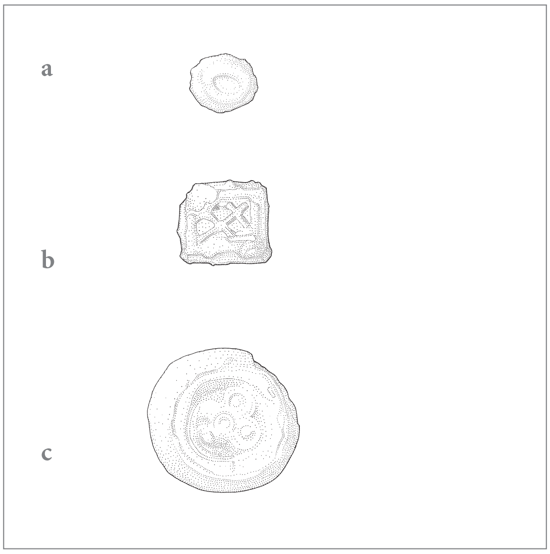


Figure 6.33 *Weights with gold.* ***a.*** *Conical lead weight with remains of gold foil (C52517/552: 1.86 g).* ***b.*** *Rectangular lead weight with a gilt copper alloy mount (C52517/419: 9.67 g).* ***c.*** *Conical copper-alloy weight with remains of gold (C52517/892: 9.27 g). Scale 1:1. Drawings, Bjørn-Håkon Eketuft Rygh.*

Figure 6.34 ***a.*** *Weight with Anglo-Saxon coins from Fjære, Aust-Agder (C7822; max.d: 1.9 cm). Photo, L.-A. Chepstow-Lusty, KHM.* ***b.*** *A Swedish weight with a pseudo-Arabic inscription (after Sperber 1996:fig.8.1).* ***c.*** *A weight with a pseudo-Arabic inscription from Rolfsøy, Østfold (C4188–97; d: 2.6 cm) Photo, Eirik Irgens Johnsen, KHM.*

weights, especially a group of cylindrical lead weights with an irregular facetted rim, but for the majority of the weights alternative 1 appears most likely.

6.4.4 Weights and symbolic meaning

So far the practical use of weighing equipment has been the main concern, but a group of at least 27 more elaborately decorated weights from the settlement invite reflection upon other meanings that may have attached to Viking-age weights and balances. Effort and value were invested in the embellishment of these weights, and it does not seem likely that their decoration served merely to distinguish the weights in a set from one another. The symbolic meaning of the weighing equipment will not be discussed exhaustively here, but along with a description of the decorated weights some interpretations will be presented showing that a wider perspective is necessary if we are fully to understand the use of weights and balances in Viking-period society.

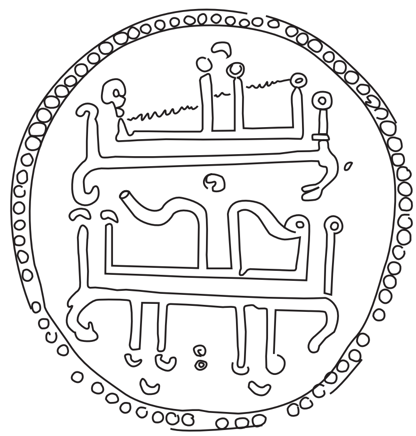
A small conical lead weight of 1.86 g is one of the more modest members of the group of decorated weights in terms of size and shape (Fig. 6.33.a). However, microscopic remains of gold foil in the circular depression on its upper face reveal that its modest size was not proportionate to its importance. Gold was undoubtedly of high value in the Viking-period, as is illustrated locally at Kaupang by the very careful handling of gold in metalwork (Pedersen, in prep.). The small lead weights may appear less sophisticated than the cubo-octahedral and oblate spheroid weights, but this conical lead weight was apparently seen differently by its producer and user(s). Decoration in gold is not restricted to this weight. A further four weights from Kaupang have remains of gold: respectively a rectangular lead weight with a gilt mount (Fig. 6.33.b), a conical copper-alloy weight (Fig. 6.33.c), and two further weights discussed below (Figs. 6.37.a and 6.42.b).

These weights with gold are not unique to Kaupang. A cylindrical lead weight with gold foil has been found in a grave at Birka (Kyhlberg 1980b:299) and weights with gilt mounts are known from several Norwegian graves (see below). Some weights thus seem to have been objects of considerable value in themselves (Kyhlberg 1980b:269). This is consistent with the careful handling of the weighing equipment evident in several grave finds (above, 6.3.1).

It can be suggested that the gold inlay may refer to the use of weights in handling precious metal. Considering the specific weights with such appliqués at Kaupang, this should be concerned primarily with the weighing of gold. The use of weights when weighing gold in the Viking and Migration Periods has been demonstrated, *inter alios,* by Brøgger (1921: 24–45) and, as discussed above (6.4.2), there is some evidence of the weighing of gold at Kaupang. The hoards imply that the weighing of gold was even more common in the Migration Period. Most finds, including weights from this period, included objects of gold too.[69] At Kaupang, weights were probably more often used in weighing silver, but it is possible that (some) lead weights, even in this later period, were primarily associated with the weighing of the more valuable gold.

Sites other than Kaupang show that silver was used to decorate weights too. A set of seven copper-alloy weights with silver inlays have been found at Lundeborg, where there was activity from the 3th century to the 7th (Thomsen 1993:80 and 94–100). In light of the poor preservation of silver at Kaupang, it is possible that silver appliqués could have been lost here (Figs. 6.39–6.40). Coins that appear to be of silver were used to decorate lead weights in the Viking-period (Fig. 6.34.a). Thus a very direct reference to the use of weights in weighing coin seems to be expressed by the Anglo-Saxon styccas mounted on to two lead weights in a 9th(?)-century grave from Aust-

a



b

c

Agder (Skaare 1976:Catalogue I.67).[70] The amount of silver in the styccas is very low, but this does not necessarily count against the interpretation: rather it explains why the two coins were taken out of circulation and mounted on to the weights. Their symbolic value as coins was probably more important than their economic value as metal. Three similar weights have been found in England, one of them at Torksey in Lincolnshire (Kruse 1992:82; Blackburn 2002:99). Written sources record that the Viking great army camped at Torksey in 872 and the site has a large collection of different weight-types, silver coins, hacksilver and ingots, reflecting the weight-economy of the Scandinavians (Blackburn 2002). The site and the weights could thus be seen as reflexes of the collection of tribute characterizing the Scandinavian invasion. Although these weights have been found in England, their context at Torksey implies that Scandinavians could have been involved in their production, as lead weights with various types of appliqué are characteristic of other Scandinavian sites such as Kaupang and Birka. If otherwise, and Anglo-Saxon production can be demonstrated, the association of coins and weights might nevertheless have been the reason why these weights were kept by Scandinavians, brought back to their homeland, and finally deposited in a grave.

Even oblate spheroid weights of copper alloy/iron could have involved a corresponding, but less direct, reference to coins. One of the oblate spheroid weights (Fig. 6.34.c) in the chamber grave at Rolfsøy has special decoration corresponding to the decoration characteristic of a small group of weights with imitations of Arabic inscriptions inside a beaded border (Sperber 1996:96–101). This decoration is similar

69 St4547, B4590, B4842 and C26001 (notes 30–35).

70 C7816–30, Vik, Fjære, Aust-Agder.

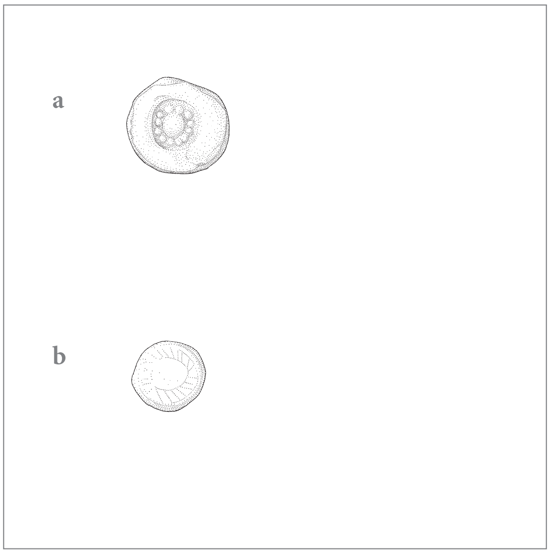


Figure 6.35 *Decorated lead weights:* ***a.*** *With a "flower" punchmark (C52264/3.3 3.83 g)* ***b.*** *With a carved border (C52517/1985 of 3.57 g). Scale 1:1. Drawings, Bjørn-Håkon Eketuft Rygh.*

Figure 6.36 *Lead weight with an inlay of glass (C52519/15228 of 1.96 g; max. d: 0.9 cm). Photo, Eirik Irgens Johnsen, KHM.*

to the script on dirhams (Fig. 6.34.b). The Arabic inscriptions are the characteristic feature of Islamic coins, and I have therefore suggested that for a Scandinavian, this decoration could have connoted the handling of coins (Pedersen, U. 2001:26–7). If so, the oblate spheroid weights might be a parallel to the lead weights with coins, expressing the close relationship between weights and coins – or even with silver more generally, as a considerable proportion of the silver that reached Scandinavia during the Viking Period came in the form of coin (Steuer 1987:480). Like the gold appliqués, the coin-weights and the oblate spheroid weights might have expressed the owner's access to the precious metal that could lay a foundation for his or her future economic and/or social success. Viking-period silver and gold were more than a form of currency: they were media in the battle for social position (Samson 1991; Hedeager 1993).

The lead weights with gold belong to a larger, heterogeneous group of decorated lead weights (Figs. 6.35–6.40). The small conical lead weight actually has an almost identical counterpart, of the same weight, but decorated with an inlay of green glass instead of gold (Fig. 6.36). Another cylindrical weight seems to have been decorated with semi-circular punchmarks and an iron inlay(?), but this weight is now heavily corroded (C52517/2609). Lead weights from Kaupang are, with few exceptions, decorated only on one side (Figs. 6.33 and 6.35–6.40; Tab. 6.13; Appendix 3). A cylindrical weight with a flower-like punchmark (Fig. 6.35.a) on both top and bottom is the only exception within the group of elaborately decorated weights. The most modest decoration is found on a small cylindrical lead weight with a delicately carved border on its upper face (Fig. 6.35.b).

In addition to the weight with the gilt mount (Fig. 6.33.b), a further nine lead weights are, or have been, decorated with copper alloy in different ways (Figs. 6.37.a and 6.38; Appendix 1). The most impressive weight has a mount in the shape of a bird (Fig. 6.37.a). This naturalistic, gilt bird covers much of a rather irregular lead plate. The bird is depicted in profile and has a slightly bent head characterized by a large crooked beak and a prominent eye. Distinct feathers cover its body, while its wing has conspicuous horizontal lines. Its surviving foot ends in three claws. This gilt copper-alloy bird was most probably re-used on the weight, as a series of other mounts found on lead weights (see below). There are some Scandinavian Viking-period depictions of naturalistic birds: for instance on the Sigurd carving on Ramsundsberget in Södermanland (Hed Jakobsson 2003: fig. 30). There are also some naturalistic bird brooches of the 11th and 12th centuries (Pedersen, A. 2001) but the bird has its closest parallel in Insular

Figure 6.37 ***a.****Weight consisting of a gilt copper-alloy bird cast in a lead plate (C52517/2168 of 15.88 g; max. l: 2.6 cm, max. w: 2.3 cm). Photo, Eirik Irgens Johnsen, KHM.*
b. *Panel on a cross shaft from Croft-on-Tees, North Yorkshire. Photo, T. Middlemass, Corpus of Anglo-Saxon Stone Sculpture.*


a


b

art, on the stone frieze from Croft-on-Tees in North Yorkshire (Fig. 6.37.b) dated to the late 8th century (Youngs 1999:288 and fig. 23.6). Some of the Scandinavian birds have a feathered body (Pedersen, A. 2001), but they all have quite short legs, unlike the birds on the weight and in the Croft-on-Tees frieze. It is therefore most likely that the bird itself was produced in an Insular workshop, like a series of other Insular mounts on lead weights found in Norway, including Kaupang (see below).

The other weights with copper-alloy traces are very varied. One rectangular weight has a now lost rectangular mount (C52517/2734), while one conical weight has a relatively well-preserved circular copper-alloy mount (Fig. 6.38.d). This mount has lines radiating from a central circle towards the rim and a hollow space inside the circle which could indicate that it originally had some kind of inlay – for instance of amber or glass. Another rectangular weight (Fig. 6.38.a) could have had a similar mount or a copper-alloy mantle, but now it has only a sunken area with some heavily corroded remains of copper alloy. Two of the weights have a copper-alloy mantle on their upper surface: respectively a triangular weight (Fig. 6.38.b) and a hemispherical weight (A66IVs). One heavily corroded cylindrical(?) lead weight has a relatively modest rectangular inlay of copper alloy (Fig. 6.38.c). Finally, two weights have fainter traces of copper alloy (C52519/15176 and C52517/2134). Nine (12?) further weights have a depression on their upper surface indicating that they originally had some kind of inlay or were intended to have one (Figs. 6.39–6.40). During the conservation process possible remains of amber have been observed in a depression on the top of one of these, a cylindrical lead weight (Fig. 6.39.c). No other remains of inlays have been identified. As some of these weights have quite small depressions, it is possible that the depressions should be regarded as punched-dot decoration. The weight

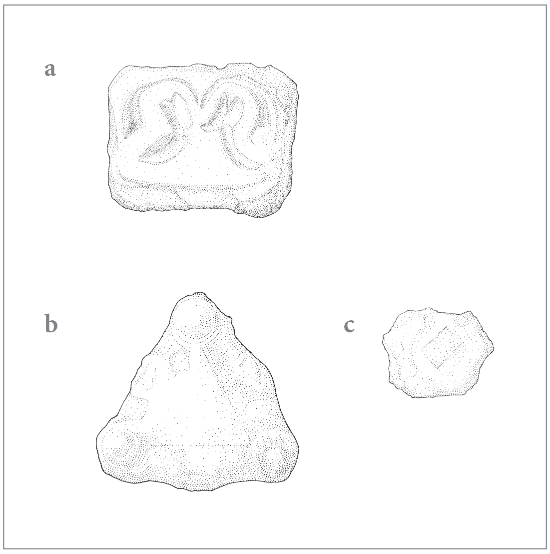


Figure 6.38 *Lead weights with copper-alloy decoration.* ***a.*** *C52517/812 (22.46 g)* ***b.*** *C52517/1893 (23.48 g)* ***c.*** *C52517/828 (7.61 g).* ***d.*** *69PIo (33.1 g) (d: 2.1 cm). Photo, Eirik Irgens Johnsen, KHM. Scale 1:1. Drawings, Bjørn-Håkon Eketuft Rygh.*

with the possible amber remains has a very small cavity, illustrating the problem of distinguishing one category of marking or decoration from the other when the material is corroded.

Weights with elaborate decoration are not a distinctive characteristic of the settlement of Kaupang. Similar weights have been found in other Scandinavian settlements and graves. The weights with glass and amber have close parallels at Birka, where some lead weights have inlays of precious stone (Sperber 2004: 71). A lead weight with a glass inlay is reported from the Viking camp at Torksey (Blackburn 2002: 99). Similar, and even more elaborate weights with appliqués are found elsewhere in Norway – for instance at Hurum, c. 60 km further north on the Oslofjord coast, were a lead weight with a gilt copper-alloy mount and an amber inlay has been found in a grave

(Fig. 6.41.a). At least another six graves,[71] one hoard,[72] and a stray find,[73] have similar weights (Fig. 6.41.b–d), all being made of lead and ornamented with Insular mounts, most often gilt (Wamers 1985:17–27). All of these finds are from the west coast of Norway. According to Egon Wamers (1985:17–24), the majority of the Insular mounts on these weights are of ecclesiastical origin. These weights are generally larger than those from the settlement at Kaupang. Once again, the settlement finds indicate that weights from graves represent a selection from a much larger corpus.

The two weights from Kaupang with gilt copper-alloy mounts – the rectangular weight (Fig. 6.33.b) and the bird weight (Fig. 6.37.a) – probably belong to this group with Insular decoration. The bird has further parallels in Insular art besides the Croft-on-Tees frieze: for instance on a fragment from the Lindisfarne scriptorium depicting the eagle of St John in a very similar manner, but with an even more powerful attitude (Webster and Backhouse 1991:catalogue 83b). The mount of the rectangular weight is heavily corroded, but its net-pattern is found on Insular works such as the harness from the grave at Soma, Western Norway (Wamers 1985:taf. 21–2).

Looked at in light of the local lead weight-production at Kaupang and the considerable quantity of decorated lead weights, the local manufacture of some of these weights can be suggested. The two strikingly similar lead weights with inlays of gold and glass respectively appear as potentially local products. When it comes to the weights with Insular mounts, Insular production appears more likely, in spite of the weights found in the Norwegian graves

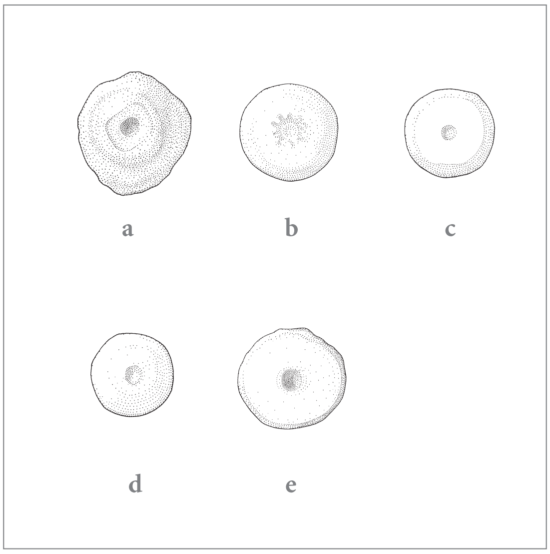
71 St1981, B4511i-k, B6356m, B11131d-e, T1047 and T18198c-d.

72 B1856.

73 T3213.

Figure 6.39 *A selection of lead weights with depression indiacting that they originally had mount or inlay.* ***a.*** *C52519/14958 (12.24 g),* ***b.*** *C52517/114 (8.39 g)* ***c.*** *C52517/2637(3.57g)* ***d.*** *C52519/14890 (3.95 g)* ***e.*** *C52517/974 (9.8 g). Scale 1:1. Drawings, Bjørn-Håkon Eketuft Rygh.*

Figure 6.40 *A selection of lead weights with depression indiacting that they originally had mount or inlay. Photo, Eirik Irgens Johnsen, KHM.*



and at Kaupang. As Susan Kruse (1992) has convincingly argued, larger sets of weights decorated this way are found in Insular contexts. Both the Viking camp at Torksey (Blackburn 2002:98), and the Viking base at Woodstown in Ireland (Downham 2004:74), have produced several weights decorated with mounts of different types. These weights could still have been Scandinavian products, but then more likely produced abroad than at home (Kruse 1992:82).

In some cases it would appear that the mounts and not the weights themselves were the primary object of attention in the production of the weights, as the shaping of the weight seems to have been determined by the appliqué (Fig. 6.41.a). Nevertheless, their weights accord with the weight-standard. The weight from Hedrum, for instance, is of 294.8 g, equal to 12 later øre of 24.6 g or 11 early øre of 26.8 g. Amongst the smaller weights with appliqués or inlays from Kaupang there is only one well-preserved weight, the tiny weight of 1.9 g with the glass inlay, but another, C52517/1893 (Fig. 6.38.b), of 23.48 g, has undergone very little alteration, so that its original weight was c. 24 g, or Brøgger's later øre.

Although the majority of the mounts appear fairly regular, they are usually fragments of larger objects. Several originate from shrines, like that from Hurum which once belonged to a house-shaped reliquary (Wamers 1985:18). These objects have accordingly very commonly been interpreted as booty from Viking raids (Bakka 1963:5; Wamers 1985:85). The mounts on the weights form part of a wider assemblage of Insular objects in Scandinavia, often found in graves. In support of the interpretation of the objects as booty, it has been emphasised that they are

Figure 6.41 *Weights with copper-alloy mounts.* ***a.*** *Hurum (CMXXXb). Photo, Arnold Mikkelsen, National Museum of Denmark.* ***b.*** *Tårland (B1856). Photo, Ann Mari Olsen, Bergen Museum.* ***c.*** *Håland (St1982). Photo, Terje Tveit, Museum of Archaeology, Stavanger.* ***d.*** *Hopperstad (B4511i). Photo, Ann Mari Olsen, Bergen Museum.*

mostly re-worked into new objects by the Scandinavians (Wamers 1985:85, 1991). The interpretation of the Insular material as booty has recently been criticized by drawing attention to the considerable circulation of ecclesiastical objects in secular contexts within the British Isles, and the fact that monastic and secular craft-production overlapped to a degree (Gaut 2001:113–25). It has also been stressed that the alteration of objects is already a trend in Scandinavia prior to the first raids on Insular monasteries, and a general trend elsewhere in Europe too (Gaut 2001: 97–100). The latter is illustrated in the corpus of weights by a specimen from Håland with a fragment of ornamental metalwork in Scandinavian style (Fig. 6.41.c).

One of the graves with an Insular mount on a weight, the 10th-century grave from Setnes, Møre og Romsdal,[74] contains some very peculiar artefacts, which seem to provide direct evidence of plundering abroad – namely a shrine obviously forced open and a possible fragment of a bishop's staff (Marstrander 1963:129–31 and 144). It is implausible that a more or less complete reliquary shrine ever came on to the market and could be bought by a passing Scandinavian. Seen in this context, at least these two mounted lead weights in the Setnes grave appear to be associable with a Viking raid on the British Isles. Wamers (1991:117) has also stressed that the use of some of ecclesiastical objects in Scandinavian women's dress can be quite ostentatious. Compared with the wide variety of decorated weights from the settlement at Kaupang, it also appears that re-used ecclesiastical or para-ecclesiastical objects are over-represented in the grave finds. These weights thus seem to be favoured as grave goods compared with other embellished weights. No matter how these objects were attained abroad, it is highly likely that at home they primarily bear witness to a successful raid. Like the weights associable with silver or gold, they may have referred to wealth obtained abroad in a general way. The fact that most of these appliqués are gilt speaks for a close relationship between these two groups of weights. An equally ostentatious reference to valuables plundered abroad is inscribed in runes on a silver neckring found at Senja, Troms, dated to the early 11th century (Olsen 1960:127–35). It reads: *Fórum drengja Fríslands á vit, ok vígs fôtum vér skiptum:* "We travelled to meet the warriors of Friesland, and exchanged the profits of war".

If the final owner of the shrine at Setnes was the raider in person this challenges the popular picture of the plundering masculine Viking – the grave is a woman's grave. In any event, the shrine itself and this exceptional woman's grave serve to remind us that the symbolic meaning attached to weighing equipment could extend far beyond its daily use. As a balance serves to compare the amounts in two scales with one another, it appears to have the potential of supporting abstract thinking. The balance has served as a symbol throughout history. Both in Ancient Egypt (Sperber 1996:13–6) and within Christianity (Hermansen 1936:fig. 3) it was associated with the weighing of souls. In Viking-period society, where gift and counter-gift were essential to the establishment and maintenance of social relations and the construction of hierarchies, this potential might again have been triggered. This seems to be underlined by the use of weights and balances as metaphors in the later Norse written sources. In *Óláfs saga Helga* it is said of Erling Skjalgsson: *... engi lagði í aðra skál en hann vildi ...:* literally, "nobody put anything in any other scale than the one he desired", but meaning that nobody did anything at all against his will. Similar use of the idiom *... lagði í aðra skál ...* is also found in the Bishops' Sagas and Flateyjarbók (Cleasby et al. 1869:541). From the latter text it is apparent that it is words that are weighed against each other. Weights could likewise be used to talk about doing what one

wanted, besides being used as a metaphor for esteem (Cleasby et al. 1869:425). This could explain why weighing equipment was selected for grave deposition. The equation of weights with esteem agrees with the interpretations suggested above: that the weights connoted the possession of valuables essential to social success.

The eagle mounted on the lead weight belongs to a small group of zoomorphic weights. One of the most distinctive weights found during the 1998–2003 campaign is shaped as an animal head, resembling a seal's head (Fig. 6.42.a). Its eyes are represented by two large depressions, and it has a large nostril and an emphatic mouth, almost like a muzzle. It is possible that the cavities for the eyes once had inlays, although no remains of such could be identified today. Another beast-like animal head was found during Blindheim's excavation. This gilt copper-alloy head (Fig. 6.42.b) is filled with lead and has a long snout, emphatic ears and eyes with eyebrows, scrolled nostrils and pointed teeth. This is also an Insular ecclesiastical object, or rather a fragment of one. It originates from the ridge of the roof of a house-shaped reliquary shrine (Wamers 1985:18). The seal, on the other hand, seems to have been produced as a weight as it stands, and I would suggest a Scandinavian origin as most likely. Seen in its Insular context, with the close resemblance to the eagle of St John and the birds from the inhabited vine-scroll on the Croft-on-Tees frieze, it is possible that the bird was of ecclesiastical origin too.

These zoomorphic weights are not rare birds. Several similar weights are known from Norwegian and Insular graves. A grave from Hopperstad, Vik, Sogn contained an animal head (Fig. 6.43.b) with similarities to the weight from Blindheim's excavations. This weight also originates from a similar house-shaped shrine (Wamers 1985:18). A similar gilt animal head with eyes of glass was found in a grave at

74 T18198.

Hurum, Buskerud (Fig. 6.43.a). As it is hollow underneath, it was once interpreted as the shaft of a knife (Undset 1878:42), but as the animal head was found inside the scale-pan together with the two weights, an interpretation as a weight is more likely. A Viking-age grave from Setnes, Romsdal, Western Norway contains a weight (Fig. 6.43.c) with a complete animal represented in Irish style. Similar zoomorphic weights are also found in Scandinavian graves outside Scandinavia, such as an early 9th-century grave from Ballyholme, Northern Ireland (Brøgger 1921:fig. 19–28) and a grave on Colonsay, Scotland (Brøgger 1921:fig. 29–35). The representation of animals is even found on several balances, for instance one from Haug, Verdal, Nord-Trøndelag,[75] which is decorated with an animal head on both tips of the beam. The balance from Jåtten, Rogaland (Brøgger 1921:fig. 6a),[76] is decorated with two bronze birds, one on each chain. A small copper-alloy bird is even mentioned amongst the possible objects of standardized weight found in purses in Birka (Kyhlberg 1980b: 228), but no picture of this artefact has been published.

The house-shrine animal is undoubtedly closely related to the other ecclesiastical Insular mounts on weights, but the re-use of these particular parts of shrines as weights by the Scandinavians seems far from accidental, as animals are fundamental to Viking-age art. Siv Kristoffersen (1995), Lotte Hedeager (1997; 1999b; 2003) and others have emphasised the active use of animal art in Scandinavian Iron-age society. It seems highly likely, as a result, that the embellishment of the weights and balances was much more than passive decoration. Kristoffersen (1995:11) argues that the animal art is not a representation of an animal, but rather that it *is* the animal, or creates an animal. This animal art was rooted in the Norse mythology (Hedeager 1999b) and makes strong reference to the transformation or shape-changing of the human soul into an animal (Kristoffersen 1995:12–4). Depictions of animals could, for instance, invoke the *dyrefylgja,* a totemic shadow animal existing in the Otherworld but able to cross the border into this world to protect someone (Kristoffersen 1995:13; Hedeager 1999b:233). It is noteworthy in this respect that the eagle has been pinpointed as an important *fylgja*-animal along with the bear, the boar and the wolf (with its pointed teeth) (Hedeager 2004). We can probably never truly grasp the symbolic meaning of the animal-weights, but as all Scandinavian people may indeed have felt dependent upon animal helpers (Hedeager 1999b:234) it can be suggested that reference to such animals would be in accord with the use of weights and balances to weigh precious metals. In written sources and material culture a wide range of animals are portrayed as the helpers of gods and humans. Amongst birds, Hugin and Munin gather knowledge for Odin when flying around the world, while the hero Sigurd is forewarned of a fatal attack by birds in *Fáfnismál* (Fáfnismál:32–9). The two birds overhanging the scale-pans of the Jåtten balance (Kilger, this vol. Ch. 8:Fig. 8.22) are strongly reminiscent of the two birds in the scene depicted on Ramsundsberget, Södermanland, Sweden, where the two birds in the tree top watch over Sigurd (Hed Jakobsson 2003:fig. 30). The birds on the balance might have watched the weighing of the valuable metals. Viking-period exchange has been described as a risky business. The relationship between the parties was strictly defined in respect of each specific type of exchange (Miller 1986). An unfortunate choice of form of exchange could have drastic consequences for the individuals involved (Miller 1986; Hedeager 1993). Some

75 T19010c.

76 B4772a.

Figure 6.42 *Two zoomorphic weights from Kaupang.* ***a.*** *C52516/4096 (6.59 g; h: 1.4 cm).* ***b.*** *Bryggen 67k (19.604 g; l: 3.5 cm). Photos, Eirik Irgens Johnsen, KHM.*

Figure 6.43 *Zoomorphic weights from Norwegian graves.* ***a.*** *Hurum, Buskerud (CMXXXI). Photo, Arnold Mikkelsen, National Museum of Denmark.* ***b.*** *Hopperstad, Sogn og Fjordane (B4511k). Photo, Ann Mari Olsen, Bergen Museum.* ***c.*** *Setnes, Romsdal, (T18198d). Photo, NTNU, Museum of Natural History and Archaeology.*

a

b

c

help from better informed animal helpers would be desirable in a situation where both valuables and social reputation were at stake.

6.5 Summary

The weights and balances from the settlement of Kaupang contribute to an understanding of the Viking-period comparanda from Norway by both adding to and complementing a large collection of grave finds. The most striking characteristic of the Kaupang assemblage is the large quantity of lead weights and the considerable heterogeneity. In the settlement at Kaupang, lead weights of different types appear first in the second quarter of the 9th century. Only 17 of the 410 weights have been found in a datable stratigrafied context – the rest are loose finds, for the most part from plough-layers. Due to the lack of preserved settlement deposits from the period post-AD 840/850, it is hard to know how the use of weights may have varied after their introduction. Only a few of the weights can be given a narrower date on the strength of their type. However, on such evidence one can conclude that at least 18% of the weights were used after 860/880.

On the basis of the grave finds from Kaupang it is evident that weights and balances were still used in the settlement in the first half of the 10th century. Although no firm conclusion can be drawn from the finds from Kaupang, graves in South-Eastern Norway and the settlement finds and graves at Birka suggest that while lead weights were predominant in the 9th century, they are totally outnumbered by weights of copper alloy or copper alloy/iron by the 10th century. Over time, weights were used in most parts of the settlement area at Kaupang, but at least prior to AD 840/850 they seem to have been handled with great care, and normally used indoors.

þveiti/ertog/øre-weights of lead, or multiples of 4 g, were a characteristic element at Kaupang. Accordingly the settlement finds from Kaupang demonstrate that the few weights of lead of this standard which Brøgger observed in grave finds from rural areas along with the many oblate spheroid copper-alloy(/iron) weights belong to a much larger, heterogeneous group of lead weights. The punched-dot decoration on some of the lead weights seems to be a marking of units in a standardized way, but able to refer to several different units, foremost the þveiti (4 g), the ertog (8 g) and the ½ later øre (12 g). From the Kaupang finds, it is difficult to determine when the þveiti/ertog/øre-weights were introduced, although two weights suggest that c. 8 g and another multiple of 4 g were in use as early as the second quarter of the 9th century. This is a very limited statistical basis, but these nonetheless make up 40% of all the weights from SP II.

The weights of different types and material were highly useful equipment used in several different situations. The large amount of weights in the settlement of Kaupang could partly reflect the local production of lead weights. As equipment, the weights and balances were also used in connexion with metalcasting, in trade – weighing hacksilver, and very probably also in other transactions such as tax-collection, gift-exchange, and the payment of tribute. The weights at Kaupang also served as symbols, expressing identity, status and very probably religious ideas too.

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Appendix 1-4

Appendix 1 Weights from the settlements of Kaupang and Huseby

Museum no.	Intrasis-id *	Material	Type **	Sub-type	Uncertain	Irregular	Weight	Change
KAUPANG:								
1956-74:								
	C62IVppp	Lead	Cylindrical	Straight side			2.053	Little
	A65IVp	Lead	Biconical	Straight ends/ sharp carination			4.02	Little
	MO59/65IVm2	Lead	Cylindrical	Oval			24.057	Little
	D64IVyy	Lead	Rectangular prism	Square/ flat			3.47	Little
	A63IVcc	Lead	Oblate spheroid				25.376	Some
	A63IVt	Copper alloy	Cubo-octahedral				2.15	Some
	A63IVl (1)	Copper alloy	Cubo-octahedral				1.04	Some
	A63IVk	Copper alloy	Conical	Rounded top	X		3.03	Little
	A65IVw	Lead	Cylindrical	Convex side		X	2.59	Much
	C62IVvvv	Lead	Cylindrical	Straight side			7.994	Some
	MO59/65IVl	Copper alloy	Cubo-octahedral				1.54	Much
	C62IViii	Lead	Conical	Truncated cone			3.858	Little
	MO60IVzz	Lead	Segmented		X	X	2.554	Some
	MO60IVyy	Lead	Cylindrical	Straight side			1.285	Little
	MO60IVww	Lead	Conical	Truncated cone			26.172	Little
	MO60IVvv	Lead	Cylindrical	Convex side			7.983	Little
	MO60IVk	Copper alloy	Cubo-octahedral				1.078	Much
	MO59IVn	Copper alloy	Biconical	Straight ends/ sharp carination			2.278	Much
	MO59IVl	Copper alloy	Cubo-octahedral				1.277	Much
	C62IVwww	Lead	Cylindrical	Convex side			2.751	Little
	B54/70IVc	Lead	Conical	Truncated cone			36.135	Much
	BO66IVk	Lead	Cylindrical	Convex side			3.1	Much
	A66IVm	Lead	Segmented				11.394	Little
	A66IVs	Lead	Segmented				38.788	Much
	Bryggen 67k	Copper alloy	Other	Animal head filled with lead		X	19.604	Much
	69Plo	Lead	Conical	Truncated cone			33.097	Some
	D63IVpp	Lead	Cylindrical	Straight side			14.634	Some
	BO66IVf	Lead	Rectangular prism	Cubic			3.7	Little
C52505/ 73	BO59 nr.103	Copper alloy/ iron	Oblate spheroid					Much
C52505/ 1301		Copper alloy/ iron	Oblate spheroid					Much
C52505/ 1875		Copper alloy/ iron	Oblate spheroid				77	Much
1998-2003:								
C52003 c1	9940153	Lead	Cylindrical	Straight side			4.4	Little
C52003 c2	9940154	Lead	Segmented			X	36.3	Little
C52003 c3	9940155	Lead	Cubo-octahedral				8.5	Much
C52003 c4	9940132	Lead	Cylindrical	Convex side			6.9	Some
C52105a		Lead	Conical	Truncated cone		X	17.8	Some
C52263/ 1	9941730	Lead	Cylindrical	Oval			37.69	Little
C52264/ 3.1	9940401	Copper alloy	Cubo-octahedral				2.9	Some
C52264/ 3.2	9940459	Copper alloy	Cubo-octahedral				2.8	Some
C52264/ 3.3	9940735	Lead	Cylindrical	Straight side			3.83	Little
C52264/ 3.4	9940513	Lead	Cylindrical	Convex side			7.2	Little
C52264/ 3.5	9940590	Lead	Segmented			X	22.6	Some
C52264/ 3.6	9941035	Lead	Other	Mushrom-shaped	X	X	15.1	Little
C52264/ 3.7	9940486	Lead	Conical	Truncated cone		X	13.4	Some
C52516/ 365	1000276	Lead	Rectangular prism	Rectangular/ flat/ cut corners			4.05	Some
C52516/ 413	1000370	Lead	Rectangular prism	Square/ flat			2.12	Little
C52516/ 416	1000373	Lead	Cylindrical	Oval			1.96	Some
C52516/ 917	1000951	Lead	Biconical	Straight ends/ sharp carination		X	4.33	Little
C52516/ 2218	1002374	Lead	Cylindrical	Straight side			1.46	Some
C52516/ 3164	1003381	Copper alloy	Rectangular prism	Rectangular/ flat	X		10.16	Some
C52516/ 3770	1004012	Lead	Cylindrical	Straight side			9.15	Some
C52516/ 3854	1004103	Lead	Segmented				1.23	Little
C52516/ 4096	1004472	Copper alloy	Other	Animal head		X	6.59	Some
C52516/ 4097	1004473	Copper alloy	Cubo-octahedral				0.32	Some
C52516/ 4103	1004479	Lead	Rectangular prism	Square/ flat		X	10.62	Little
C52516/ 4104	1004480	Lead	Cylindrical	Straight side			4.77	Little
C52516/ 4299	1004777	Copper alloy/ iron	Oblate spheroid				2.35	Much
C52516/ 5772	1004182	Lead	Rectangular prism	Cubic	X		3.62	Some
C52516/ 5773	1021893	Lead	Conical	Pointed top/ convex side	X		4.42	Little
C52517/ 42	28630	Lead	Cylindrical	Straight side	X	X	6.52	Some
C52517/ 51	28717	Copper alloy	Cubo-octahedral				1.624	Some

* The weights from the Blindheim excavations are referred to by their preliminary catalogue number (for an introduction to this number see Pedersen 2000).

** The delimitation of the groups is based on the following definitions:
Conical: diameter top/diameter base ≤ 0.9
Cylindrical: diameter top/base > 0.9
Oblate spheroid lead weights: diameter middle/ends ≤ 0.7
Biconical: pronounced or marked equatorial line

Decoration	L	W	Ht	Diam	Diam base	Diam top	Context	Main context
None			0.4	0.8			M3	1956–74: (LMPL?)
Punched dot			0.6	1	0.8	0.8	Stray find	1956–74: ?
None			0.65		2.3	2.1	D3 (?)	1956–74: (LMPL?)
None	1.1	1	0.4				H17, black-earth layer	1956–74: (LMPL)
None			1.4	1.7	1	1	W-7, black-earth layer	1956–74: (LMPL)
None				Ca. 0.9			W-6, black-earth layer	1956–74: (LMPL)
Not preserved	Max: 0.6						X-3, black-earth layer	1956–74: (LMPL)
None				1.5			V-2, black-earth layer	1956–74: (LMPL)
None			0.4	1.1			Mixed BO/A site	1956–74: (LMPL?)
Depression			0.6	1.4			N5, black-earth layer	1956–74: (LMPL)
Not preserved				0.7			Building wall HI	1956–74: (LMPL?)
None			0.6		0.9	0.8	M4, black-earth layer	1956–74: (LMPL)
None			0.7	0.9			C1v, black-earth layer	1956–74: (LMPL)
Punched dot			0.3	0.8			B7, black-earth layer	1956–74: (LMPL)
None			1.15		1.8	1.4	E1, black-earth layer	1956–74: (LMPL)
None			0.6	1.3			D7, upper black-earth layer	1956–74: (LMPL?)
Not preserved				0.6			D2	1956–74: (LMPL?)
None			0.7	1.1		0.5	F2	1956–74: (LMPL?)
Not preserved							Y-2	1956–74: (LMPL?)
None			0.5	0.9			Stray find	1956–74: ?
Depression			2.2		2.1	1.25	B10, black-earth layer	1956–74: (LMPL)
None			0.5	1.1			A/BO-site by gravel ridge HV	1956–74: (LMPL?)
None			0.9	1.5			YZ-1-2	1956–74: (LMPL?)
Mantle of copper alloy			1.5	2.1-2.4			X6	1956–74: (LMPL?)
Gilt	3.44	Max: 1.97	Max. 1.96				H20/21	1956–74: (LMPL?)
Mount of copper alloy			1.5	2.1	1.9		Test pit -J+7	1956–74: ?
None	2.2	2	0.4				K5, black-earth layer	1956–74: (LMPL)
None	0.9	0.7	0.6				By the wall alongside the stream	1956–74: ?
Not preserved				Max: 2.2			29.26 from 0/ 3.14 from B. C,	
							black-earth layer	1956–74: (LMPL?)
Not preserved	Max: 2.5						D2	1956–74: (LMPL?)
Not preserved			2.7	3.2			?	1956–74: ?
None?			0.46	1.14			O993998	MPS
Textile imprint			1.61	1.83			O993998	MPS
None	1.19	1.18	1.2				O993998	MPS
None			0.78	1.39	1.16	1.16	O993996	MPS
Punched dot			1.2		1.9	1.35	Stray find	Stray find
None			0.72	2.9			O993995	MPS
Not preserved	Max: 0.85	Max: 0.79	Max: 0.75				O993992	MPS
Not preserved	Max: 0.85	Max: 0.8	Max: 0.78				O993992	MPS
"Flower" punchmark			0.4	1.25			O993992	MPS
None			0.45	1.57			O993992	MPS
None			1.35	1.88			O993992	MPS
None			1.35	1.5			O993992	MPS
None			1.09		1.52		O993992	MPS
None	1.43	1.18	0.33			AL4360/ G1000198	SP I-III?	
None	1	0.94	0.32				A3315/ R5G1000224	SP II?
None			0.26	1.06			A1021858/ G1000226	LMPL
None			0.55	1.1	0.86	0.84	AL100/ G1000867	LMPL?
None			0.42	0.78			A3549	SP I-III?
Punched dot	2.3	1.4	0.7				A11958	SP I-III?, 3B
Punched dot			0.5	1.71			AL1112/ G1004010	LMPL?
None			0.42	0.72			A12794	?
Lost inlay for eyes?	Base: 1.13	Base: 1.02	1.43				AL100/ G5653	LMPL?
Not preserved?	Max: 0.47	Max: 0.47	Max: 0.43				AL100/ G5430	LMPL?
None	1.43	1.37	0.61				AL1004419/ G1004486	MPS
None			0.58	1.05			A1635	?
Not preserved			1	1.35			A27825	?
None	0.8	0.78	0.68				AL100/ G5430	LMPL?
None			1.02		1.07		A1635	?
None			0.95	1.11			O28687	MPS
Punched dot	0.68	0.68	0.65				O28687	MPS

Museum no.	Intrasis-id *	Material	Type **	Sub-type	Uncertain	Irregular	Weight	Change
C52517/ 52	28718	Copper alloy/ iron	Oblate spheroid				24.6	Much
C52517/ 60	28726	Lead	Segmented				2.62	Little
C52517/ 61	28727	Lead	Segmented				7.77	Little
C52517/ 90	990016	Lead	Segmented		X	X	15.15	Some
C52517/ 97	990024	Lead	Segmented			X	12.44	Little
C52517/ 104	990031	Lead	Cylindrical	Straight side			3.73	Little
C52517/ 111	990039	Lead	Cylindrical	Convex side			4.36	Little
C52517/ 114	990042	Lead	Biconical?	Straight ends/ marked carination			8.39	Some?
C52517/ 119	990047	Lead	Cylindrical	Straight side			1.56	Little
C52517/ 152	990085	Lead	Cylindrical	Straight side			7.76	Little
C52517/ 153	990086	Lead	Cylindrical	Straight side/ cut rim			26.51	Little
C52517/ 169	990108	Copper alloy	Cubo-octahedral				2.973	Much
C52517/ 186	990126	Lead	Cylindrical	Straight side			2.06	Little
C52517/ 190	990130	Lead	Cylindrical	Straight side		X	3.89	Little
C52517/ 191	990131	Lead	Cylindrical	Straight side			8.43	Some
C52517/ 217	990158	Lead	Cylindrical	Straight side/ cut rim		X	1.63	Little
C52517/ 225	990166	Lead	Rectangular prism	Square/ flat			3.61	Little
C52517/ 227	990168	Lead	Segmented		X		2.04	Some
C52517/ 233	990174	Lead	Segmented		X		1.86	Some
C52517/ 244	990185	Lead	Cylindrical	Straight side/ convex top			202.94	Some
C52517/ 250	990191	Lead	Cylindrical	Straight side			14.33	Little
C52517/ 257	990199	Copper alloy	Segmented		X		11.441	Some
C52517/ 258	990200	Lead	Cylindrical	Convex side			7.71	Little
C52517/ 263	990205	Lead	Cylindrical	Convex side			4.13	Little
C52517/ 264	990206	Lead	Other	Truncated pyramid	X		10.32	Little
C52517/ 267	990209	Lead	Biconical	Straight ends/ sharp carination			7.85	Little
C52517/ 273	990215	Lead	Cylindrical	Straight side			37.21	Little
C52517/ 277	990219	Lead	Segmented				7.47	Little
C52517/ 278	990221	Lead	Cylindrical	Straight side			8.24	Little
C52517/ 280	990224	Copper alloy	Cubo-octahedral				1.899	Much
C52517/ 283	990228	Lead	Oblate spheroid?			X	74.48	Some
C52517/ 286	990231	Lead	Biconical	Straight ends/ sharp carination			11.41	Some
C52517/ 295	990240	Lead	Segmented			X	1.3	Little
C52517/ 298	990243	Lead	Oblate spheroid				15.27	Little
C52517/ 310	990256	Lead	Rectangular prism	Cubic		X	22.01	Some
C52517/ 315	990261	Lead	Cylindrical	Straight side/ cut rim			8.88	Little
C52517/ 316	990262	Lead	Cylindrical	Straight side			18.71	Little
C52517/ 317	990263	Copper alloy	Cubo-octahedral				3.154	Much
C52517/ 337	990284	Lead	Conical	Truncated cone			20.73	Some
C52517/ 339	990286	Lead	Cylindrical	Straight side		X	3.14	Little
C52517/ 350	990298	Lead	Cylindrical	Straight side			20.97	Some
C52517/ 363	990311	Lead	Conical	Truncated cone		X	7.44	Some
C52517/ 383	990332	Lead	Cubo-octahedral				5.29	Little
C52517/ 404	990355	Lead	Cylindrical	Straight side			2.36	Little
C52517/ 407	990359	Lead	Conical	Truncated cone			7.54	Some
C52517/ 419	990371	Lead	Rectangular prism	Cubic			9.67	Some
C52517/ 421	990373	Lead	Segmented				7.57	Little
C52517/ 431	990383	Lead	Cylindrical	Straight side		X	7.78	Some
C52517/ 433	990385	Lead	Cylindrical	Straight side			23.17	Little
C52517/ 437	990390	Lead	Biconical	Straight ends/ sharp carination			7.25	Some
C52517/ 440	990393	Lead	Cylindrical	Convex side			16.52	Little
C52517/ 443	990396	Lead	Cylindrical	Straight side		X	1.48	Some
C52517/ 449	990402	Lead	Cylindrical	Straight side			23.78	Little
C52517/ 457	990410	Lead	Cubo-octahedral				3.73	Some
C52517/ 465	990418	Copper alloy	Cubo-octahedral				1.448	Much
C52517/ 471	990425	Lead	Cylindrical	Straight side		X	38.51	Much
C52517/ 473	990427	Lead	Oblate spheroid				22.27	Some?
C52517/ 483	990438	Lead	Cylindrical	Straight side			3.93	Little
C52517/ 487	990442	Lead	Cylindrical	Straight side			3.89	Little
C52517/ 499	990454	Lead	Biconical?	Straight ends/ marked carination			98.78	Little
C52517/ 507	990462	Copper alloy	Cubo-octahedral				1.558	Little
C52517/ 525	990480	Copper alloy	Cubo-octahedral				1.896	Much
C52517/ 528	990483	Lead	Rectangular prism	Rectangular/ high		X	10.57	Some
C52517/ 529	990484	Lead	Cylindrical	Straight side			13.83	Some
C52517/ 544	990501	Lead	Conical	Truncated cone			7.45	Little
C52517/ 552	990509	Lead	Conical	Truncated cone			1.86	Some?
C52517/ 560	990517	Lead	Other	6-sided prism	X		17.96	Little
C52517/ 600	990564	Lead	Cylindrical	Straight side			11.19	Little
C52517/ 617	990582	Lead	Cylindrical	Concave side			4.13	Little
C52517/ 630	990597	Lead	Cylindrical	Straight side			11.99	Little
C52517/ 640	990608	Lead	Cylindrical	Convex side			4.05	Some
C52517/ 645	990614	Lead	Conical	Truncated cone	X		7.82	Little
C52517/ 670	990641	Lead	Conical	Truncated cone			24.76	Little
C52517/ 675	990646	Lead	Conical	Truncated cone			12.15	Some

Decoration	L	W	Ht	Diam	Diam base	Diam top	Context	Main context
Not preserved			Max: 1.7	2.4	1.65	1.65	O28687	MPS
None			0.52	1.06			O28687	MPS
None			0.72	1.35			O28687	MPS
None			0.95	1.88			O990000	MPS
None			1.27	1.37			O990000	MPS
None			0.48	1.06			O990000	MPS
None			0.56	1.09	0.88	0.84	O990000	MPS
Depression			0.78	1.3	0.99	0.99	O990000	MPS
None			0.38	0.78			O990000	MPS
None			0.66	1.33			O990000	MPS
Punched dot			0.81	2.11			O990000	MPS
Punched dot	0.92	Max: 0.85	Max: 0.84				O990000	MPS
None			0.39	0.9			O990000	MPS
None			0.39	1.31			O990000	MPS
Iron pin?			0.66	1.34			O990000	MPS
None			0.52	0.8			O990000	MPS
None	0.89	0.89	0.59				O990000	MPS
None			0.65	0.82			O990000	MPS
None			0.61	0.82			O990000	MPS
Remains of iron			2.22	3.53			O990000	MPS
None			0.8	1.55			O990000	MPS
None			1.15	Max: 1.82			O990000	MPS
None			0.76	1.28	1.14	1.14	O990000	MPS
None			0.63	1	0.77	0.77	O990000	MPS
None			1.2		1.05 x 1.15	0.9 x 0.6	O990000	MPS
None			1	1.41	0.99	0.94	O990000	MPS
None			1.21	2.17			O990000	MPS
None			0.75	1.27			O990000	MPS
Punched dot			0.88	1.11			O990000	MPS
Punched dot	0.79	0.72	Max: 0.68				O990000	MPS
None			2.2	2.83	1.75	1.75	O990000	MPS
None			0.91	1.51	1.02	0.83	O990000	MPS
None			0.35	0.84			O990000	MPS
None			1.07	1.51	1	1	O990000	MPS
None	1.48	1.47	1.28				O990000	MPS
Punched dot			0.54	1.54			O990000	MPS
Punched dot			0.73	1.84			O990000	MPS
Punched dot	0.9	0.89	0.88				O990000	MPS
None			1.18		2.05	1.56	O990000	MPS
None			0.65	1.07			O990000	MPS
None			1.03	1.66			O990000	MPS
None			0.75		1.34	1.13	O990000	MPS
None	0.91	0.84	0.89				O990000	MPS
None			0.65	0.79			O990000	MPS
None			0.83		1.29	0.95	O990000	MPS
Gilt mount of copper alloy	1.25	1.17	1.17				O990000	MPS
None			0.95	1.15			O990000	MPS
None			0.75	1.28			O990000	MPS
Punched dot			1.01	1.82			O990000	MPS
Remains of iron?			0.95	1.28	0.65	0.65	O990000	MPS
None			0.94	1.61	1.3	1.3	O990000	MPS
Punched dot			0.45	0.82			O990000	MPS
Punched dot			1.14	1.68			O990000	MPS
None?	0.85	0.7	0.87				O990000	MPS
Not preserved	Max: 0.80	Max: 0.68	Max: 0.70				O990000	MPS
Punched dot	Max: 3.4		0.95				O990000	MPS
None			1.32	1.7	1.07	1.07	O990000	MPS
None			0.35	1.31			O990000	MPS
None			0.55	1.06			O990000	MPS
None			2.01	2.77	2	1.86	O990000	MPS
Punched dot	0.67	0.64	0.62				O990000	MPS
Not preserved	Max: 0.74	Max: 0.71	Max: 0.68				O990000	MPS
None	1.33	1.1	1.03				O990000	MPS
None			0.62	1.81			O990000	MPS
None			0.9		1.15	0.99	O990000	MPS
Inlay of gold			0.6		0.89	0.67	O990000	MPS
None	1.99	1.66	1.15				O990000	MPS
None			0.76	1.46			O990000	MPS
Punched dot			0.97	0.79			O990000	MPS
None			0.83	1.49			O990000	MPS
None			0.51	1.11	0.96	0.96	O990000	MPS
None			1.11		1.41	0.55	O990000	MPS
None			1.05		1.86	1.68	O990000	MPS
None			1.1		1.55	1.2	O990000	MPS

Museum no.		Intrasis-id *	Material	Type **	Sub-type	Uncertain	Irregular	Weight	Change
C52517/	685	990657	Lead	Biconical	Straight ends/ sharp carination			31.4	Little
C52517/	708	990681	Lead	Cylindrical	Convex side			23.95	Little
C52517/	712	990686	Lead	Cylindrical	Irregular side		X	12.28	Some
C52517/	714	990688	Lead	Segmented				4.53	Little
C52517/	760	990740	Lead	Cylindrical	Straight side			4.06	Little
C52517/	761	990741	Copper alloy	Cubo-octahedral				0.878	Much
C52517/	765	990745	Lead	Segmented		X	X	8.32	Little
C52517/	766	990746	Lead	Rectangular prism	Square/ flat			26.68	Little
C52517/	772	990752	Lead	Cylindrical	Straight side			7.91	Little
C52517/	777	990757	Lead	Segmented				24.54	Little
C52517/	783	990763	Copper alloy	Cubo-octahedral				0.778	Much
C52517/	791	990772	Lead	Cylindrical	Straight side			1.97	Little
C52517/	793	990774	Lead	Rectangular prism	Rectangular/ high			14.75	Little
C52517/	794	990775	Lead	Conical	Truncated cone			7.97	Little
C52517/	796	990777	Copper alloy	Cubo-octahedral				1.529	Much
C52517/	811	990792	Copper alloy/ iron	Oblate spheroid				3.45	Much
C52517/	812	990793	Lead	Rectangular prism	Rectangular/ flat			22.46	Some
C52517/	814	990795	Lead	Segmented				2.19	Some?
C52517/	817	990798	Lead	Cylindrical	Straight side			2.39	Much
C52517/	818	990799	Lead	Cylindrical	Convex side			37.96	Some
C52517/	822	990803	Lead	Segmented		X	X	3.93	Little
C52517/	828	990811	Lead	Rectangular prism?	Rectangular/ flat		X	7.61	Much
C52517/	846	990830	Lead	Cylindrical	Straight side			5.71	Little
C52517/	856	990840	Lead	Cylindrical	Convex side			16.44	Little
C52517/	857	990841	Lead	Other	Star-shaped	X		8.56	Little
C52517/	863	990847	Lead	Cylindrical	Straight side			3.18	Much
C52517/	870	990854	Lead	Segmented			X	8.27	Little
C52517/	874	990858	Lead	Cylindrical	Straight side		X	5.31	Some
C52517/	892	990877	Copper alloy	Conical				9.27	Some
C52517/	897	990882	Lead	Conical	Truncated cone			3.73	Little
C52517/	908	990893	Lead	Biconical	Straight ends/ sharp carination			4.41	Little
C52517/	916	990902	Lead	Cylindrical	Straight side			3.81	Little
C52517/	918	990904	Lead	Cylindrical	Straight side			163.4	Some
C52517/	921	990907	Lead	Rectangular prism	Rectangular/ high			13.32	Some
C52517/	930	990917	Lead	Cylindrical	Straight side/ cut rim			20.65	Much
C52517/	934	990921	Copper alloy	Cylindrical	Straight side	X		6.483	Some
C52517/	935	990922	Lead	Biconical	Straight ends/ sharp carination			37.55	Some
C52517/	936	990923	Lead	Biconical	Straight ends/ sharp carination			10.8	Some
C52517/	940	990927	Lead	Cylindrical	Straight side			10.6	Some
C52517/	962	990952	Lead	Cylindrical	Straight side			13.77	Some
C52517/	965	990955	Lead	Cylindrical	Straight side			12.47	Some
C52517/	969	990961	Lead	Cylindrical	Straight side			25.39	Little
C52517/	974	990966	Lead	Cylindrical	Straight side			9.8	Some
C52517/	982	990975	Lead	Oblate spheroid				15.48	Little
C52517/	984	990977	Lead	Cylindrical	Straight side			23.07	Some?
C52517/	986	990979	Lead	Rectangular prism	Square/ flat			6	Some
C52517/	989	990982	Lead	Cylindrical	Straight side			6.93	Some
C52517/	990	990983	Lead	Conical	Rounded top			6.76	Some
C52517/	995	990988	Lead	Conical	Truncated cone/ concave side		X	6.69	Little
C52517/	1006	991000	Copper alloy	Cubo-octahedral				3.171	Some
C52517/	1008	991002	Lead	Cylindrical	Convex side		X	6.83	Much
C52517/	1043	991038	Lead	Cylindrical	Straight side			32.11	Little
C52517/	1044	991039	Lead	Cylindrical	Straight side			3.84	Little
C52517/	1062	991058	Lead	Cylindrical	Straight side/ convex end	X		13.23	Little
C52517/	1073	991069	Lead	Cylindrical	Straight side		X	6.02	Much
C52517/	1493	993043	Lead	Cylindrical	Straight side			6.55	Little
C52517/	1505	993057	Lead	Conical	Truncated cone			24.63	Little
C52517/	1531	993084	Lead	Cylindrical	Straight side			2.08	Little
C52517/	1538	993093	Lead	Biconical	Straight ends/ sharp carination			10.28	Some
C52517/	1641	105003	Lead	Cylindrical	Straight side			11.58	Some
C52517/	1658	105020	Lead	Cylindrical	Straight side			3.11	Some
C52517/	1664	105027	Copper alloy	Cubo-octahedral				2.315	Some
C52517/	1665	105028	Lead	Conical	Truncated cone			6.71	Much
C52517/	1681	105044	Lead	Conical	Truncated cone			6.68	Some
C52517/	1688	105051	Lead	Cylindrical	Straight side		X	11.55	Little
C52517/	1693	105056	Lead	Cylindrical	Straight side		X	3.19	Little
C52517/	1707	105070	Copper alloy	Cubo-octahedral				3.47	Some
C52517/	1721	105087	Lead	Segmented			X	6.28	Some
C52517/	1734	105105	Lead	Cylindrical	Straight side			2.99	Little
C52517/	1742	105118	Lead	Segmented			X	11.57	Little
C52517/	1746	105122	Copper alloy/ iron	Oblate spheroid				91.42	Some
C52517/	1750	105126	Lead	Cylindrical	Straight side			19.36	Some
C52517/	1781	105165	Lead	Cylindrical	Straight side			4.33	Some
C52517/	1789	105173	Lead	Cylindrical	Straight side			3.69	Little?

Decoration	L	W	Ht	Diam	Diam base	Diam top	Context	Main context
Punched dot			1.47	2.09	1.55	1.44	O990000	MPS
None			1.01	1.84	1.56	1.51	O990000	MPS
None			0.85	1.57			O990000	MPS
None			0.7	1.04			O990000	MPS
None			0.62	1.01			O990000	MPS
Punched dot	0.62	0.59	Max: 0.58				O990000	MPS
None			6.5	1.29			O990000	MPS
None	2.41	2.33	0.64				O990000	MPS
None			0.54	1.43			O990000	MPS
None			1.25	1.92			O990000	MPS
Punched dot	Max: 0.58	Max: 0.58	Max: 0.57				O990000	MPS
None			0.53	0.76			O990000	MPS
None	1.43	1.18	0.92				O990000	MPS
Punched dot			0.8		1.25	1	O990000	MPS
Not preserved	0.77	Max: 0.72	Max: 0.65				O990000	MPS
Not preserved			0.8	1.09			O990000	MPS
Inlay or mount of copper alloy	2.52	2.02	0.73				O990000	MPS
Depression			0.47	0.89			O990000	MPS
None			0.19	1.4			O990000	MPS
Punched dot			1.11	2.36	2.01	2.01	O990000	MPS
None			0.7	1.06			O990000	MPS
Inlay of copper alloy	Max: 1.49	Max: 1.22	0.79				O990000	MPS
None			0.51	1.22			O990000	MPS
Punched dot			0.82	1.77	1.49	1.44	O990000	MPS
None	1.49	1.56	0.8				O990000	MPS
None?			0.51	1.4			O990000	MPS
None			0.91	1.34			O990000	MPS
None			0.61	1.4			O990000	MPS
Inlay of gold			0.8	2.01	0.68		O990000	MPS
None			0.54		1.05	0.8	O990000	MPS
None			0.68	1.02	0.76	0.75	O990000	MPS
Punched dot			0.47	1.12			O990000	MPS
None			1.13	4.74			O990000	MPS
None	1.36	1.14	0.99				O990000	MPS
None			1	1.89			O990000	MPS
Depression			0.52	1.73			O990000	MPS
Punched dot			1.3	2.1	1.6	1.6	O990000	MPS
None			0.85	1.46	0.89	0.96	O990000	MPS
None			1.04	1.25			O990000	MPS
None			0.99	1.77			O990000	MPS
None			0.7	1.77			O990000	MPS
None			0.65	2.43			O990000	MPS
Depression			0.68	1.41			O990000	MPS
Punched dot			1.13	1.54	0.9	0.8	O990000	MPS
Iron pin?			1.11	2.09			O990000	MPS
None	1.15	1.11	0.56				O990000	MPS
None			0.76	1.2			O990000	MPS
Punched dot			1		1.1		O990000	MPS
None			1.14		1.17	0.95	O990000	MPS
Punched dot	0.88	0.86	0.84				O990000	MPS
None			0.71	1.29	1.13	1.13	O990000	MPS
Punched dot			1.06	2.01			O990000	MPS
None			0.64	0.89			O990000	MPS
None			1.19	1.38			O990000	MPS
None			0.62	1.39			O990000	MPS
None			0.42	1.51			O992999	MPS
None			1.35		1.75	1.58	O992999	MPS
None			0.31	1.21			O992999	MPS
Punched dot			0.79	1.55	1.2	1.15	O992999	MPS
Remains of iron			0.87	1.44			O105000	MPS
None			0.38	1.14			O105000	MPS
Punched dot	0.77	0.77	0.76				O105000	MPS
None			0.84		1.38	1.2	O105000	MPS
Punched dot			0.87		1.19	0.98	O105000	MPS
Punched dot			0.77	1.94			O105000	MPS
None			0.43	1.18			O105000	MPS
Punched dot	0.88	0.87	0.86				O105000	MPS
None			0.81	1.29			O105000	MPS
None			0.7	0.85			O105000	MPS
None			0.7	1.64			O105000	MPS
Not preserved			2.3	3.19	1.78	1.78	O105000	MPS
None			1.09	1.6			O105000	MPS
None			0.5	1.17			O105000	MPS
None			0.48	1.12			O105000	MPS

Museum no.	Intrasis-id *	Material	Type **	Sub-type	Uncertain	Irregular	Weight	Change
C52517/ 1794	105179	Lead	Cylindrical	Concave side		X	3.75	Little
C52517/ 1797	105182	Lead	Cylindrical	Straight side			3.24	Little
C52517/ 1812	105198	Lead	Cylindrical	Straight side			6.36	Some
C52517/ 1818	105204	Lead	Conical	Pointed top	X		6.66	Some
C52517/ 1820	105206	Lead	Cylindrical	Straight side			4.14	Some
C52517/ 1830	105217	Lead	Cylindrical	Straight side			3.65	Some
C52517/ 1853	105243	Lead	Cylindrical	Straight side			3.58	Little
C52517/ 1856	105246	Lead	Biconical?	One convex end / sharp carination		X	5.93	Some
C52517/ 1870	105261	Lead	Cylindrical	Straight side/ convex top		X	18.22	Much
C52517/ 1893	105285	Lead	Other	Triangular			23.48	Little?
C52517/ 1898	105291	Lead	Cylindrical	Straight side			5.25	Some
C52517/ 1900	105293	Lead	Conical	Truncated cone			3.71	Little
C52517/ 1923	105320	Lead	Rectangular prism	Cubic			7.12	Little
C52517/ 1930	105328	Copper alloy	Cubo-octahedral				2.521	Much
C52517/ 1936	105334	Lead	Cylindrical	Straight side			11.26	Little
C52517/ 1945	105344	Copper alloy	Cubo-octahedral				2.486	Some
C52517/ 1952	105351	Copper alloy	Cubo-octahedral				2.54	Much
C52517/ 1956	105355	Lead	Cylindrical	Straight side/ cut rim		X	4.01	Little
C52517/ 1976	105411	Copper alloy	Cubo-octahedral				0.88	Much
C52517/ 1985	105429	Lead	Cylindrical	Straight side			3.57	Little
C52517/ 1989	105433	Lead	Conical	Truncated cone			8.07	Some
C52517/ 1995	105444	Lead	Segmented				3.44	Some
C52517/ 1999	105455	Copper alloy	Cubo-octahedral				3.047	Some
C52517/ 2008	55006	Lead	Oblate spheroid?			X	25.53	Little?
C52517/ 2022	55020	Lead	Cylindrical	Straight side			7.54	Some?
C52517/ 2023	55021	Lead	Cylindrical	Straight side			3.53	Little
C52517/ 2034	55032	Lead	Oblate spheroid				31.68	Some
C52517/ 2045	55043	Lead	Cylindrical	Straight side			8.43	Little
C52517/ 2051	55049	Lead	Cylindrical	Straight side			10.91	Little
C52517/ 2053	55051	Copper alloy/ iron	Oblate spheroid				12.17	Some
C52517/ 2067	55065	Lead	Cylindrical	Straight side			22.33	Some
C52517/ 2076	55074	Lead	Other	Arrow-shaped prism	X		16.63	Some
C52517/ 2077	55075	Lead	Cylindrical	Straight side			22.12	Some
C52517/ 2096	55094	Lead	Cylindrical	Straight side			13.89	Some
C52517/ 2097	55095	Lead	Cylindrical	Straight side		X	8.76	Some
C52517/ 2101	55099	Lead	Rectangular prism	Cubic			12.17	Much
C52517/ 2105	55103	Lead	Rectangular prism	Square/ flat			4.71	Some
C52517/ 2108	55106	Lead	Other	Triangular		X	9.13	Little
C52517/ 2123	55121	Lead	Cylindrical	Straight side		X	2.9	Some
C52517/ 2134	55132	Lead	Rectangular prism	Rectangular/ high			15.39	Some
C52517/ 2144	55142	Lead	Cylindrical	Straight side		X	7.63	Some
C52517/ 2147	55145	Lead	Segmented				8.13	Little
C52517/ 2153	55151	Copper alloy	Cubo-octahedral				3.263	Some
C52517/ 2162	55160	Copper alloy	Cubo-octahedral				2.162	Much
C52517/ 2168	55170	Lead	Other	Bird on lead plate		X	15.88	Some?
C52517/ 2182	55184	Lead	Cylindrical	Straight side			19.82	Little
C52517/ 2183	55185	Lead	Other	Truncated pyramid	X		9.42	Some
C52517/ 2185	55188	Lead	Cylindrical	Half/ straight side			21.51	Much?
C52517/ 2190	55193	Lead	Cylindrical	Straight side			7.34	Little
C52517/ 2192	55195	Lead	Cylindrical	Straight side		X	7.49	Some
C52517/ 2194	55198	Lead	Segmented			X	9.11	Some
C52517/ 2202	55206	Lead	Cylindrical	Straight side			8.53	Little
C52517/ 2204	55208	Lead	Cylindrical	Convex side			11.86	Little
C52517/ 2208	55212	Lead	Conical	Truncated cone	X		9.05	Little
C52517/ 2217	55222	Lead	Cylindrical	Convex side			3.03	Little
C52517/ 2238	55243	Lead	Cylindrical	Straight side/ convex top		X	42.63	Little
C52517/ 2244	55249	Lead	Cylindrical	Convex side			4.06	Little
C52517/ 2247	55252	Lead	Conical	Truncated cone			13	Little
C52517/ 2248	55253	Lead	Cylindrical	Straight side			23.54	Little
C52517/ 2259	55264	Lead	Rectangular prism	Square/ flat			5.89	Some
C52517/ 2273	55278	Lead	Cylindrical	Convex side		X	21.53	Much
C52517/ 2274	55279	Copper alloy	Other	Pear-shaped			16.28	Little
C52517/ 2277	55282	Lead	Segmented				22.48	Little
C52517/ 2279	55284	Lead	Cylindrical	Straight side		X	2.37	Little
C52517/ 2286	55293	Lead	Cylindrical	Straight side		X	3.35	Little
C52517/ 2290	55297	Lead	Segmented				2.17	Little
C52517/ 2291	55298	Copper alloy	Cubo-octahedral				1.998	Much
C52517/ 2300	55307	Copper alloy	Cubo-octahedral				1.481	Much
C52517/ 2314	55321	Lead	Cylindrical	Straight side			7.62	Some
C52517/ 2335	55351	Lead	Cylindrical	Straight side			27.01	Little
C52517/ 2354	55370	Lead	Conical	Truncated cone		X	50.29	Little
C52517/ 2361	55384	Lead	Cylindrical	Straight side			15.61	Some
C52517/ 2372	55395	Lead	Biconical	Straight ends/ sharp carination			7.79	Little
C52517/ 2386	55411	Lead	Conical	Truncated cone		X	34.54	Some

Decoration	L	W	Ht	Diam	Diam base	Diam top	Context	Main context
None			0.74	0.95			O105000	MPS
None			0.63	0.94			O105000	MPS
None			0.62	1.25			O105000	MPS
None			1.07		1.31		O105000	MPS
None			0.5	1.17			O105000	MPS
None			0.57	1.01			O105000	MPS
None			0.44	1.14			O105000	MPS
None			0.9	1.34	0.96		O105000	MPS
Depression?			1.54	1.39			O105000	MPS
Mantle of copper alloy	2.55	2.46	0.8				O105000	MPS
None			1.01	0.99			O105000	MPS
None			0.71		1.05	0.64	O105000	MPS
Punched dot	1.05	1.03	0.88				O105000	MPS
Punched dot	0.88	Max: 0.87	Max: 0.82				O105000	MPS
Punched dot			0.83	1.44			O105000	MPS
Punched dot	0.91	0.89	0.77				O105000	MPS
Punched dot	Max: 0.89	Max: 0.88	Max: 0.86				O105000	MPS
None			0.6	0.98			O105000	MPS
Punched dot	0.62	0.61	0.61				O105000	MPS
Carved border			0.56	0.93			O106000	MPS
Punched dot			1.03		1.35	1.18	O106000	MPS
None			0.69	2.01			O106000	MPS
Punched dot	0.94	0.9	0.86				O106000	MPS
None			1.41	1.84	1.21		O55000	MPS
Depression?			0.56	1.39			O55000	MPS
None			0.38	1.26			O55000	MPS
None			1.73	1.91	1.2	1.2	O55000	MPS
None			0.48	1.59			O55000	MPS
Punched dot			1.05	1.33			O55000	MPS
Not preserved			1.4	1.52	0.9	0.9	O55000	MPS
Punched dot			1.2	1.59			O55000	MPS
None	1.9	1.55	0.95				O55000	MPS
Punched dot			0.92	1.96			O55000	MPS
Punched dot			0.74	1.68			O55000	MPS
None			0.82	1.36			O55000	MPS
None	1.21	1.15	1.04				O55000	MPS
None	0.94	0.96	0.55				O55000	MPS
None	1.81	1.69	0.77				O55000	MPS
Remains of decoration?			0.68	0.95			O55000	MPS
Remains of copper alloy	1.8	1.5	0.78				O55000	MPS
None			0.81	1.2			O55000	MPS
None			0.82	1.41			O55000	MPS
Punched dot	0.97	0.95	0.92				O55000	MPS
Punched dot	Max: 0.89	Max: 0.78	Max: 0.77				O55000	MPS
Gilt mount of copper alloy	Max: 2.6	Max: 2.33	Max: 0.99				O55000	MPS
Punched dot			0.66	1.9			O55000	MPS
None			1.5		0.98 x 1.05	0.81 x 0.5	O55000	MPS
None			2.1	1.23			O55000	MPS
None			0.6	1.37			O55000	MPS
Remains of iron			0.67	1.51			O55000	MPS
None			0.7	1.59			O55000	MPS
Punched dot			0.64	1.36			O55000	MPS
None			0.74	1.65	1.48	1.48	O55000	MPS
None			0.94		1.6	0.55	O55000	MPS
None			0.53	0.96	0.86	0.86	O55000	MPS
None			1.2	2.34			O55000	MPS
None			0.73	1	0.8	0.8	O55000	MPS
None			1.14		1.28	1.1	O55000	MPS
None			1.15	1.65			O55000	MPS
None	1.6	1.14	0.49				O55000	MPS
Remains of iron			1.2	2.32	2.11	2.11	O55000	MPS
None			2.1	1.69			O55000	MPS
None			1.3	1.74			O55000	MPS
None			0.43	1.05			O55000	MPS
None			0.64	0.96			O55000	MPS
None			0.36	1.14			O55000	MPS
Punched dot	Max: 0.77	Max: 0.77	Max: 0.77				O55000	MPS
Not preserved	Max: 0.71	Max: 0.64	Max: 0.62				O55000	MPS
None			0.74	1.2			O55000	MPS
Punched dot			0.84	2.22			O55000	MPS
None			Max: 1.19		2.67	2.31	O55000	MPS
None			0.73	1.87			O55000	MPS
None			0.8	1.24	0.96	0.96	O55000	MPS
Punched dot			0.8		2.57	2.16	O55000	MPS

Museum no.		Intrasis-id *	Material	Type **	Sub-type	Uncertain	Irregular	Weight	Change
C52517/	2392	55424	Lead	Cubo-octahedral				11.54	Little
C52517/	2416	55448	Lead	Cubo-octahedral			X	4.16	Little
C52517/	2419	55451	Lead	Conical	Truncated cone		X	7.74	Some
C52517/	2420	55452	Lead	Cylindrical	Straight side			48.3	Some
C52517/	2424	55457	Lead	Cylindrical	Straight side			6.5	Little
C52517/	2436	55469	Lead	Cylindrical	Straight side			25.9	Little
C52517/	2437	55470	Lead	Cylindrical	Straight side		X	4.89	Some
C52517/	2448	55481	Lead	Cylindrical	Straight side			10.93	Some
C52517/	2460	55493	Lead	Conical	Truncated cone		X	3.54	Little
C52517/	2465	55499	Lead	Cylindrical	Straight side			3.36	Much
C52517/	2468	55502	Lead	Conical	Truncated cone			7.36	Little
C52517/	2473	55507	Copper alloy/ iron	Oblate spheroid				62.1	Much
C52517/	2485	55519	Copper alloy/ iron	Oblate spheroid				18.71	Much
C52517/	2491	55525	Lead	Cylindrical	Straight side		X	10.16	Some
C52517/	2523	55559	Copper alloy	Cubo-octahedral				3.038	Little
C52517/	2529	55565	Lead	Cylindrical	Straight side			3.99	Little
C52517/	2538	55575	Lead	Segmented			X	3.1	Little?
C52517/	2544	55581	Lead	Cylindrical	Straight side		X	10.88	Little?
C52517/	2548	55585	Copper alloy	Cubo-octahedral				2.93	Much
C52517/	2550	55587	Lead	Cylindrical	Straight side			7.43	Little
C52517/	2558	55595	Lead	Cylindrical	Straight side			2.86	Much
C52517/	2561	55598	Copper alloy	Cubo-octahedral				2.88	Some
C52517/	2574	55611	Copper alloy/ iron	Oblate spheroid				19.83	Much
C52517/	2584	55621	Lead	Segmented	Half			10.78	Much?
C52517/	2609	55646	Lead	Cylindrical	Straight side		X	3.87	Much
C52517/	2610	55647	Lead	Cylindrical	Half/ straight side			4.29	Much?
C52517/	2621	55658	Copper alloy	Cubo-octahedral				3.307	Some
C52517/	2625	55662	Lead	Conical	Truncated cone			16.87	Little
C52517/	2629	55666	Lead	Cylindrical	Straight side			2.83	Little
C52517/	2630	55667	Copper alloy	Cubo-octahedral				1.932	Much
C52517/	2631	55668	Lead	Rectangular prism	Cubic			11.52	Little
C52517/	2635	55672	Lead	Conical	Truncated cone			3.89	Little
C52517/	2637	55674	Lead	Cylindrical	Straight side			3.57	Some?
C52517/	2643	55680	Lead	Oblate spheroid?				11.75	Little
C52517/	2653	55690	Lead	Cylindrical	Straight side			3.83	Some
C52517/	2668	55707	Lead	Cylindrical	Straight side		X	33.56	Little
C52517/	2680	55720	Lead	Cylindrical	Straight side			1.33	Little
C52517/	2688	55728	Lead	Cylindrical	Straight side			3.03	Little
C52517/	2691	55731	Copper alloy	Cubo-octahedral				2.096	Much
C52517/	2698	55738	Lead	Other	Plate-shaped	X	X	1.15	Little
C52517/	2706	55747	Lead	Conical	Truncated cone		X	6.87	Little?
C52517/	2722	55763	Lead	Cylindrical	Straight side			23.8	Little
C52517/	2729	55771	Lead	Cylindrical	Straight side			17.3	Much
C52517/	2734	55783	Lead	Rectangular prism	Cubic			24.04	Some
C52519/	9376	1001816	Lead	Cylindrical	Convex side			7.93	Little
C52519/	9878	1007125	Lead	Cylindrical	Convex side			3.96	Little
C52519/	11891	1040293	Lead	Rectangular prism	Rectangular/ flat	X	X	12.33	Little
C52519/	12147	1007126	Lead	Cylindrical	Straight side			4.08	Some?
C52519/	12170	1007127	Lead	Cylindrical	Convex side			4.95	Little
C52519/	13467	1021468	Lead	Cylindrical	Straight side			21.92	Much
C52519/	13521	1014635	Copper alloy/ iron	Oblate spheroid				10.69	Much
C52519/	13548	1015266	Lead	Cylindrical	Straight side		X	1.89	Little
C52519/	13756	1017645	Lead	Conical	Truncated cone			19.15	Little
C52519/	13835	1017646	Lead	Cylindrical?	Straight side	X		0.88	Much
C52519/	13871	1017583	Lead	Cylindrical	Straight side			4.2	Little
C52519/	13888	1017524	Copper alloy/ iron	Cubo-octahedral				3	Some
C52519/	14001	1008914	Lead	Segmented			X	12.59	Little
C52519/	14007	1008927	Lead	Cylindrical	Straight side			1.29	Little
C52519/	14008	1008878	Lead	Cylindrical	Straight side		X	3.46	Some
C52519/	14030	1008934	Lead	Biconical	Small ends/ sharp carination	X		8.33	Little
C52519/	14049	1009189	Lead	Cylindrical	Straight side			1.65	Little
C52519/	14053	1009435	Lead	Biconical	Straight ends/ sharp carination			15.84	Little
C52519/	14108	1015939	Lead	Cylindrical	Straight side			1.23	Some
C52519/	14260	1013649	Copper alloy/ iron	Oblate spheroid				26.9	Much
C52519/	14310	1012852	Lead	Conical	Pointed top	X	X	2.6	Little
C52519/	14326	1013053	Lead	Cylindrical	Straight side			1.53	Little
C52519/	14336	1013335	Copper alloy	Cubo-octahedral				1.066	Much
C52519/	14344	1012863	Lead	Cylindrical	Straight side			4.47	Much
C52519/	14353	1013713	Copper alloy	Cubo-octahedral				1.57	Much
C52519/	14357	1013221	Lead	Cylindrical	Concave side/ convex ends			2.11	Little
C52519/	14448	1012045	Lead	Cylindrical	Concave side			7.88	Some
C52519/	14501	1011716	Lead	Cylindrical	Straight side			24.14	Little
C52519/	14716	1016451	Copper alloy/ iron	Oblate spheroid				13.08	Some
C52519/	14730	1008966	Lead	Cylindrical	Convex side			5.37	Little

Decoration	L	W	Ht	Diam	Diam base	Diam top	Context	Main context
None	1.16	1.06	1.21				O55000	MPS
None	0.83	0.79	0.85				O55000	MPS
Punched dot			Max: 1.06		1.36	1.2	O55000	MPS
None			1.34	2.37			O55000	MPS
None			0.6	1.26			O55000	MPS
None			0.83	2.23			O55000	MPS
None?			0.37	1.61			O55000	MPS
Punched dot			0.78	1.47			O55000	MPS
None			1.07		0.82	0.62	O55000	MPS
None			0.39	1.41			O55000	MPS
None			0.79		1.2	1.02	O55000	MPS
Not preserved			2.06	2.9		1.9	O55000	MPS
Not preserved			Max: 1.18	1.52		1.2	O55000	MPS
None			1.05	1.19			O55000	MPS
Punched dot	0.83	0.8	0.76				O55000	MPS
None			0.58	1.06			O55000	MPS
Depression?			0.65	0.9			O55000	MPS
None			0.6	1.86			O55000	MPS
Punched dot	Max: 0.87	Max: 0.83	Max: 0.77				O55000	MPS
None			0.45	1.57			O55000	MPS
None			0.41	1.09			O55000	MPS
Punched dot	0.83	0.83	0.82				O55000	MPS
Not preserved			Max: 1.6	1.91		1.14	O55000	MPS
None			0.8	2.22			O55000	MPS
Punchmarks and remains of iron			0.66	1.22			O55000	MPS
None		0.92	0.45	1.56			O55000	MPS
Punched dot	Max: 0.84	Max: 0.84	Max: 0.83				O55000	MPS
None			0.82		1.79	1.53	O55000	MPS
None			0.54	0.92			O55000	MPS
Not preserved	Max: 0.72	Max: 0.70	Max: 0.96				O55000	MPS
None	1.16	1.16	0.99				O55000	MPS
None			0.8		0.98	0.66	O55000	MPS
Depression with inlay of amber?			0.39	1.19			O55000	MPS
None			0.88	1.46	1.03		O55000	MPS
Knob?			0.54	1.04			O55000	MPS
None			1.03	1.2			O55000	MPS
None			0.22	1.2			O55000	MPS
None			0.45	1			O55000	MPS
Punched dot	Max: 0.77	Max: 0.74	Max: 0.72				O55000	MPS
Punched dot	1.1	0.92	0.26				O55000	MPS
None			0.77		1.38	0.8	O55000	MPS
None			0.8	1.92			O55000	MPS
None			1.17	2.35			O55000	MPS
Lost mount of copper alloy?	1.64	1.5	1.34				O55772	MPS
Punched dot			0.7	1.3	1.15	1.15	AL15467/ G7238	MPS
None			0.43	1.34	1.14	1.14	AL15467/ G15559	MPS
None	1.6	1.4	0.7				T14863	MPS?
None			0.45	1.1			AL15467/ G7218	MPS
None			0.63	1.08	0.81	0.81	AL15467/ G7302	MPS
None			Max: 1.27	1.75			AL46011/ G47501	LMPL
Not preserved			1.35	1.57	1.07	1.07	A1035711/ AL43104/ G43148	SP I-III
None			0.6	0.69			AL15467/ G15539	MPS
None			1.34		1.61	1.04	AL15467/ G29577	MPS
None	Max: 0.97	Max: 0.86	Max: 0.44				AL45018/ G45045	LMPL
None			0.41	1.22			AL49986/ G49989	LMPL
Punched dot	0.89	0.93	0.94				AL37654/ G37895	LMPL
None			0.74	1.63			AL15467/ G29580	MPS
None			0.17	1.1			AL15467/ G29598	MPS
None			0.38	1.35			AL15467/ G29602	MPS
None			1.3	1.51	0.5	0.35	AL15467/ G29925	MPS
Punched dot			0.23	1.11			AL15467/ G15551	MPS
Punched dot			1	1.63	1.28	1.11	AL15467/ G29860	MPS
None			0.29	0.87			AL45018/ G45047	LMPL
Punched dot			1.5	2.21		1.42	AL37654/ G40050	LMPL
None			0.7		1.04		AL38223/ G38275	LMPL
None			0.46	0.75			AL39332/ G39616	LMPL
Punched dot	Max: 0.67	Max: 0.63	Max: 0.60				AL37654/ G40038	LMPL
None			0.6	1.12			AL40514/ G40574	LMPL
Punched dot?	0.75	0.75	Max: 0.68				AL37654/ G41040	LMPL
None			0.48	0.78			AL37654/ G41221	LMPL
Punched dot?			0.63	1.27			AL15467/ G15519	MPS
None			0.96	1.82			AL19423/ G31971	MPS?
Not preserved				1.7	1.03	1.03	AL43092/ G43480	LMPL
None			0.67	1.09	0.86	0.81	AL15467/ G29578	MPS

Museum no.	Intrasis-id *	Material	Type **	Sub-type	Uncertain	Irregular	Weight	Change
C52519/ 14734	1010133	Lead	Cylindrical	Straight side			2.51	Little
C52519/ 14751	1016856	Lead	Cylindrical	Concave side			8.68	Little
C52519/ 14752	1016867	Lead	Conical	Truncated cone			2.76	Some
C52519/ 14780	1016866	Lead	Conical	Truncated cone			11.81	Little
C52519/ 14834	1008998	Copper alloy	Cubo-octahedral				1.54	Much
C52519/ 14890	1014057	Lead	Biconical	Straight ends/ sharp carination			3.95	Some?
C52519/ 14931	1014320	Lead	Cylindrical	Straight side			5.17	Little
C52519/ 14958	1012173	Lead	Conical	Truncated cone			12.24	Some?
C52519/ 14959	1012370	Lead	Cylindrical	Straight side		X	2.08	Some
C52519/ 14982	1009624	Lead	Cylindrical	Straight side		X	15.64	Some
C52519/ 15013	1009269	Lead	Cylindrical	Straight side			21.86	Some
C52519/ 15035	1009436	Copper alloy	Cubo-octahedral				2.805	Some
C52519/ 15038	1009614	Lead	Other	Half-cylinder	X		12.11	Little
C52519/ 15039	1009625	Lead	Cylindrical	Straight side			7.86	Little
C52519/ 15046	1009617	Lead	Oblate spheroid				8.65	Some
C52519/ 15062	1009616	Lead	Conical	Pointed top	X		3.98	Little
C52519/ 15066	1009615	Lead	Segmented				24.13	Some
C52519/ 15067	1009592	Lead	Cylindrical	Straight side			12.14	Some
C52519/ 15175	1017492	Copper alloy	Cubo-octahedral				1.17	Some
C52519/ 15176	1017494	Lead	Cylindrical	Straight side			23.72	Some
C52519/ 15228	1009750	Lead	Conical	Truncated cone			1.96	Little
C52519/ 15333	1008616	Lead	Cylindrical	Straight side			4.17	Little
C52519/ 15334	1008617	Lead	Cylindrical	Convex side			4.26	Little
C52519/ 15475	1009542	Lead	Cylindrical	Straight side			2.35	Little
C52519/ 15482	1008961	Lead	Cylindrical	Straight side			7.3	Some
C52519/ 15486	1040294	Lead	Cylindrical	Concave side			12.33	Little
C52519/ 15487	1009083	Lead	Cylindrical	Straight side			11.97	Little
C52519/ 15493	1010055	Copper alloy	Cubo-octahedral				3.14	Some
C52519/ 15497	1010124	Lead	Cylindrical	Half/ straight side		X	12.53	Much?
C52519/ 15511	1010065	Lead	Cylindrical	Straight side		X	3.5	Little
C52519/ 15512	1010066	Lead	Cylindrical	Straight side			7.74	Some
C52519/ 15518	1008930	Copper alloy	Cylindrical	Straight side	X		8.91	Little
C52519/ 15628	1004621	Copper alloy	Rectangular prism	Rectangular/ flat			3.71	Some
C52519/ 15671	16361	Lead	Cylindrical	Straight side			27.52	Little
C52519/ 15693	1001815	Lead	Cylindrical	Straight side			16.09	Little
C52519/ 15941	1004589	Lead	Conical	Truncated cone			12.47	Little
C52519/ 15946	1004631	Lead	Cylindrical	Straight side			24.35	Little
C52519/ 15959	1007124	Lead	Cylindrical	Straight side			8.15	Little
C52519/ 15961	1004588	Lead	Cylindrical	Straight side			3.79	Little
C52519/ 15964	1004629	Lead	Cylindrical	Straight side		X	7.8	Some
C52519/ 16578	1022297	Lead	Cylindrical	Convex side			7.54	Little
C52519/ 16583	1022302	Lead	Cylindrical	Straight side			21.67	Some
C52519/ 17263	1023033	Lead	Other	Conical with concave ends	X		28.2	Little
C52519/ 18388	1024162	Copper alloy	Cubo-octahedral				1.13	Much
C52519/ 19029	1024836	Lead	Conical	Truncated cone			4	Some
C52519/ 19669	1025484	Lead	Segmented			X	12.12	Little
C52519/ 20041	1025858	Lead	Biconical	Straight ends/ sharp carination			8	Little
C52519/ 20388	1026206	Lead	Cylindrical	Straight side			4.29	Much
C52519/ 23438	1029263	Lead	Cylindrical	Straight side			22.63	Some
C52519/ 24586	1030431	Lead	Cylindrical	Straight side			5.03	Little
C52519/ 40035	1035509	Copper alloy/ iron	Oblate spheroid				4.72	Much
C52519/ 40379	1014840	Copper alloy/ iron	Oblate spheroid				5.34	Much
C53160/ 7	100004	Copper alloy	Cubo-octahedral				3.539	Little
HUSEBY:								
C52518/ 434	434	Copper alloy/ iron	Oblate spheroid				19.7	Much
C52518/ 828	828	Lead	Rectangular prism	Rectangular/ flat			3.38	Some
C52518/ 927	927	Copper alloy/ iron	Oblate spheroid				23.6	Some
C52518/ 1226	1226	Lead	Rectangular prism	Rectangular/ flat			2.87	Little

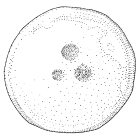
Decoration	L	W	Ht	Diam	Diam base	Diam top	Context	Main context
None			0.38	1.03			AL19423/ G30934	MPS?
None			0.75	1.27			AL44883/ G44917	LMPL
None			0.61		0.93	0.6	AL45018/ G45047	LMPL
None			0.85		1.61	0.83	AL48076/ G49034	LMPL
None?	Max: 0.78	Max: 0.74	Max: 0.73				AL29000/ G30087	MPS?
Depression			0.63	1.04	0.7	0.7	AL15467/ G29849	MPS
None			0.59	1.08			AL43092/ G43721	LMPL
Depression			1.09		1.46	1.03	Stray find	Stray find
None			0.25	1.05			AL15467/ G15475	MPS
None			1.06	1.53			AL15467/ G29847	MPS
None			1.11	1.75	1.75	1.63	AL15467/ G15551	MPS
Punched dot	0.85	0.82	0.8				AL15467/ G29849	MPS
None	1.25		0.9	1.2			AL15467/ G29860	MPS
None			0.46	1.59			AL15467/ G29860	MPS
None			0.83	1.22	0.86	0.86	AL15467/ G29872	MPS
None			0.85		1.03		AL15467/ G30011	MPS
None?			1.15	2.13			AL15467/ G30024	MPS
Iron pin?			0.72	1.65			AL15467/ G30025	MPS
Punched dot	0.63	0.61	0.6				AL48076/ G49518	LMPL
Remains of copper alloy			1.13	1.99			AL48076/ G49518	LMPL
Inlay of green glass			0.52		0.85	0.65	AL19423/ G31476	MPS?
None			0.58	1.04			AL15467/ G15607	MPS
None			0.78	1.02	0.8	0.76	AL29000/ G29030	LMPL?
None			0.52	0.78			AL15467/ G15575	MPS
None			0.45	1.65			AL15467/ G29841	MPS
None			0.71	1.58			AL15467/ G29861	MPS
None			0.86	1.51			AL15467/ G29859	MPS
Not preserved	Max: 0.93	Max: 0.91	Max: 0.89				AL15467/ G29873	MPS
None			0.62	2.07			AL15467/ G29885	MPS
None			0.33	1.39			AL15467/ G29917	MPS
None			0.65	1.37			AL15467/ G29917	MPS
None			1.07	1.24			AL15467/ G29949	MPS
None	1.2	1.04	0.74				A1019170/ AL22286	SP III
Knob			0.89	2.54			AL15467/ G1020877	MPS
None			0.75	1.73			AL15467/ G15535	MPS
None			0.84		1.6	1.34	AL15467/ G17956	MPS
Punched dot			0.91	1.94			AL19423/ G19606	MPS?
None			0.8	1.23			AL15467/ G7250	MPS
None			0.44	1.13			AL15467/ G7314	MPS
None			0.75	1.42			AL15467/ G7366	MPS
None			0.78	1.25	1.06	1.09	AL62411/ G62550	SP II sub 2, 3B
None			0.73	2.15			AL60592/ G60666	SP II sub 2?, 2A
None			1.98		1.23	1.73	AL61041/ G61487	SP II sub 2, 3B
Punched dot	0.74	0.7	0.64				AL66930/ G66976	SP III?, 1A
None			0.7		1.25	0.94	AL15467/ G30017	MPS
None			0.71	1.79			AL15467/ G30019	MPS
None			0.9	1.22	0.84	0.84	AL1022171/ G62365	SP II, 1A
None			0.55	1.45			AL65597	SP II sub 2, 3A
None			1.17	1.8	1.8	1.69	A25261/ AL65721	SP III, 2A
None			0.51	1.3			AL76555/ G76653	SP II sub 2, 3A
Not preserved			1.3	1.39			AL66930/ G66968	SP III?, 1A
Not preserved			Max: 1.18	1.56			A40814/ AL41983/ G42006	SP I-III, 4A
Punched dot	0.86	0.82	0.81				AL4453/ G4491	SP III?
Not preserved			Max: 1.32	1.9	1.14		N30:1	
None	0.98	0.91	0.58				E31:1	
Not preserved			1.56	2	1	1	E14:2	
None	1.13	1.01	0.3				B5:1	

Appendix 2 Weights and balances from the cemeteries at Kaupang

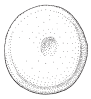
Museum no.	Preliminary-id	Material	Type	Weight	Change	Decoration
C4222		Copper alloy	Cubo-octahedral	7.142	Some	Dot decoration
C4223		Copper alloy/ iron	Oblate spheroid	21.235	Much	Dot decoration
C4232b		Copper alloy	Cubo-octahedral	Lost?		Unknown
C4240b(1)		Copper alloy/ iron	Oblate spheroid	13.783	Much	Not preserved
C4240b(2)		Copper alloy/ iron	Oblate spheroid	14.546	Much	Dot decoration?
C4240b(3)		Copper alloy	Uncertain	Lost		Unknown
	K/1954m(1)	Copper alloy/ iron	Oblate spheroid	7.8	Much	Not preserved?
	K/1954m(2)	Copper alloy/ iron	Oblate spheroid	29.2	Much	Not preserved?
	K/Vie	Copper alloy/ iron	Oblate spheroid	17.2	Much	Dot decoration
	K/XXXVg	Copper alloy/ iron	Oblate spheroid	5.4	Much	Dot decoration

Appendix 3 Drawings of punched-dot decorated lead weights from Kaupang

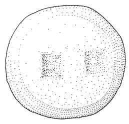
(see also Figs. 6.5 and 6.22)



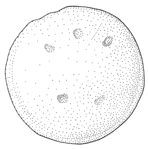
a
C52516/3770



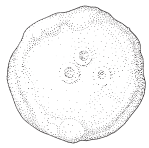
b
C52517/278



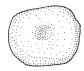
c
C52517/315



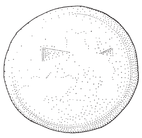
d
C52517/316



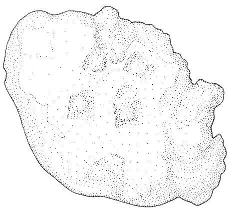
e
C52517/433



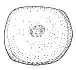
f
C52517/443



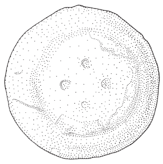
g
C52517/449



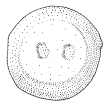
h
C52517/471



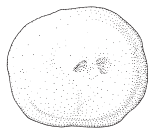
i
C52517/617



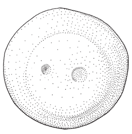
j
C52517/685



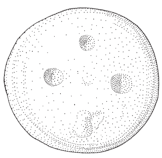
k
52517/794



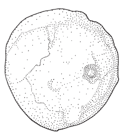
l
C52517/856



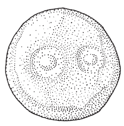
m
C52517/982



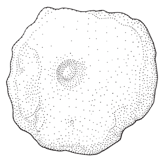
n
C52517/1043



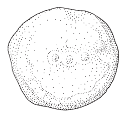
o
C52517/1538



p
C52517/1681



q
C52517/1688



r
C52517/1936

Quality decoration	Description decoration	Ht	L	W	Diam	Context
Well preserved all sides	□ 1 dot / beaded border	1.005	1.03	0.98		Ka. 4 (Mound 112)
Well preserved one side	3 dots (triskele)/ beaded border	1.79			1.83	Ka. 4 (Mound 112)
						Ka. 6 (Mound 90)
		2.2			2.46	Ka. 8 (Mound 91)
Incomplete	Part of beaded border	1.85			2.34	Ka. 8 (Mound 91)
						Ka. 8 (Mound 91)
						Ka. 282 (K/1954 grave VII)
						Ka. 282 (K/1954 grave VII)
Well preserved all sides	3 dots (triskele)/ beaded border	1.4			1.9	Found during excavation of Ka. 301 (K/VI grave 1)
Well preserved all sides	1+ 2 / 2 beaded borders	1.3			1.65	Ka. 126 (Mound 1?)

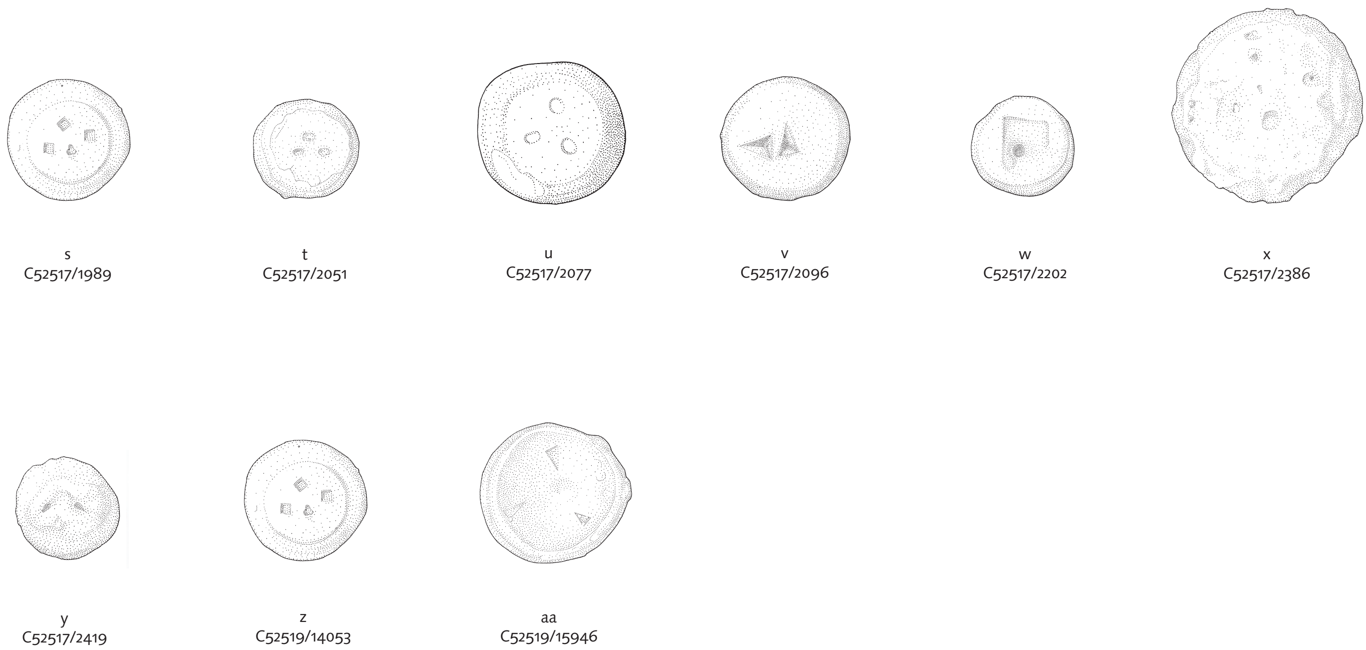


Figure 6.44 *Drawings of punched-dot decorated lead weights from Kaupang (see also fig. 6.5 and 6.22). Scale 1:1. Drawings, Bjørn-Håkon Eketuft Rygh.*

Appendix 4 Other finds of weights and/or balances in South-Eastern Norway

Museum number	Farm (gnr./bnr.), municipality (kommune), fylke	Weights	lead	regulated	Balance
CMXXX-XXXII	OBerg (25/), Hurum, Buskerud	3? (2)	2		Type 2
B5207	Nomeland, Valle, Aust-Agder	2			
C957-8	Vestre Holstad (15/), Ås, Akershus	1	1		Type 4
C1672	Nomeland (47/), Valle, Aust-Agder	6? (4)		6	
C2641	Eidsvoll, Øvre Romerike, Akershus	1		1	
C3922-5	Skeimo (6/), Vegårshei, Aust-Agder	1		1	
C4188-97	Nedre Haugen (129/), Rolfsøy, Østfold	11 (?)	3	8	Type 2
C5305-6, C5357-9	Haugen (43/), Hedrum, Vestfold	1		1	
C7816-30	Vik (24/), Fjære, Aust Agder	4	4		
C7838-44	OBrinksværmoen (40/), Fjære, Aust-Agder	2	2		
C8272-3	Sævli (21/or 22/), Fjære, Aust-Agder	8	8		Type 3
C9203-11	Åkerhaugen, Sanda, Telemark	6			Type 7
C10719-35	Vestre Engelaug (221/), Løten, Hedmark	1		1	
C10736-53	Vestre Engelaug (221/), Løten, Hedmark	2	1	1	2 x Type 3
C11790-4	Bøkeskogen, Larvik, Vestfold	3	3		
C12480-3	Nes (81/), Hedrum, Vestfold	1	1		
C12484-90	Nes (81/), Hedrum, Vestfold	2			
C12501-10	Nes (81/), Hedrum, Vestfold	1		1	
C13781-7	Århus (37/), Fyresdal, Telemark	1			Type 6
C14139-44	Roligheten (34/), Hedrum, Vestfold	1	1		
C16062	Prestegården (63/), Tune, Østfold	2	1	1	1
C17668-73	Valle (129/5),Rolfsøy, Østfold	2	2		Type 2
C19362-78	Løland (68/), Vigmostad, Vest-Agder	4 (?)	4		Type 3
C20133	Bergan (51/), Hedrum, Vestfold	4	1	1	Type 3/5
C20315	Arstad (17/), Ottetsad, Stange , Hedmark	2	2		
C21211	Såheim (129/ or 130/), Tinn, Telemark	2 (?)			Type 5
C22234	Vegusdal (11/2), Herefoss, Aust Agder	1		1	
C22766	Gile (93/2), Ø. Toten, Oppland	1		1	
C23116	Bringsvær (40/14), Fjære, Aust-Agder	8 (?)		8	Type 5/6?
C27679	Araksbø, Sandnes (32/ or 33/), Bygland, Aust-Agder	1			
C30317	Jordkjenn (21/4-6), Tvedestrand, Aust-Agder	1	1		
C30539	Nomeland (47/), Valle, Aust-Agder	21		21	
C34262	Tussehaugen, Viki (44/7), Valle, Aust-Agder	3		3	
C34684	Tussehaugen, Viki (44/7), Valle, Aust-Agder	2?	2		
C36653	Gullabråten, Majors- Alm (150/1), Brandbu, Oppland	1	1		
C38000	Smørkollen, Aker, Hedmark	1	1		
C38620	Engelaug Østre (222/1), Løten, Hedmark	6		6	Type 6
C38621	Engelaug (221/1), Løten, Hedmark	1	1		
C50270	Lunde (6/32), Farsund, Vest-Agder	1	1		
C52727/9-11	Koppang (19/264), Hedmark	3*			
C52834/7	Evje (38/1), Rygge, Østfold	1*	1		
C52518	Huseby (1032/20,21), Larvik, Vestfold	5	2	3	
C53315	Gulli (8/1), Tønsberg, Vestfold	1	1		
C53670/8	Værne kloster (89/1), Østfold	1	1		
C54954/1	Horgen (26/1), Akershus	1*			
C54963/2	Huser (17/1), Akershus	2*			
C54964/1-3	Strøm, (27/1), Akershus	3*			
C56065	Unknown	1	1		
C56279-80	Ringsaker area, bla Farberg (210/1), Hedmark	10	10		
C56281	Indre Østfold, Eidsberg og Askim	9 (8?)	9		
C56282	Unknown?	2	2		
C56283-4	Ringsaker, Hedmark	5	1	1	
C56216	Selvig, Hurum, Buskerud	1?	1		
C5046-9	Dolven (134/,135/,136/), Brunlanes, Vestfold				Type 3
C7859-64	Huseby (73/, 74/), Blaker, Akershus				Type 3
C8278-85	Fjære (19/), Fjære, Aust-Agder				Type 3
C9528-79	By (220/), Løten, Hedmark				Collapsible
C10775	OTjøme church, Rød øvre (1/1), Vestfold				1
C13458-78	Allum (73/), Hedrum, Vestfold				Type 3
C13698-715	Odeberg (114/, 115/), Hedrum, Vestfold				Type 5?
C13950-9	Råkleiv, Landvik, Hommedal, Aust-Agder				1
C14130-8	Roligheten (34/), Hedrum, Vestfold				Type 3
C15855	Bjørke (98/), Nes, Akershus				Collapsible
C18442-48	Breiland, Fyresdal, Telemark				Type 6
C18746-7	Opstad (72/, 73/), Tune, Østfold				1
C21812	The schoolhouse at Bryni, Romedal, Stange, Hedmark				1

Notes:
The classification of the balances is from Steuer (1987:list 6 and 6a, 1997:list 1 and 5–6), with a few exceptions.
* Based on information from KHM's *Gjenstandsbase* 27.10.2006.

Context	Date
Grave	10th century (Steuer 1987:Liste 6a and 462, 1997:24)
Graves, mixed	-
Grave	After c. AD 870/880 (Steuer 1987:Abb. 9)
Grave	10th century
Grave	Late Viking Age
Grave	10th century
Grave	c. AD 900 (Stylegar and Nordseng 2003:361)
Hoard	10th century (Petersen 1940:145; Skaare 1976:140)
Grave	c. AD 900 (Larsen 1986:112)
Grave	Viking Age (Larsen 1986:112)
Grave	After c. AD 870/880 (Steuer 1987:524, Abb. 9, Larsen 1986:111)
Hoard	c. AD 970/80-1300 (Steuer 1997:358, Abb. 165)
Grave	After c. AD 950 (Martens 1969:94)
Grave	11th century (Martens 1969:96)
Grave	c. AD 900-950(?)
Grave	c. AD 900-950 (Forseth 1993:315)
Grave	Viking Age
Grave	c. AD 900-950 (Forseth 1993:315)
Graves, mixed	-
Grave	c. AD 850-950 (Forseth 1993:305)
Grave	After c. AD 870/880 (Steuer 1987:Abb. 10)
Grave	c. AD 900-950 (Steuer 1987:Liste 6a and 462, 1997:24; Forseth 1993:310)
Graves, mixed	-
Graves, mixed	-
Grave	Viking Age (Kristensen 2007:136)
Grave	Late Viking Age (Petersen 1919:176)
Grave	11th century (Skaare 1976:144)
Grave	After c. AD 990 (Steuer 1997:Abb. 15:B1mittel, Abb.232)
Grave	11th century (Skaare 1976:144)
Stray find	6th-14th century
Grave	Viking Age
Grave	After AD 1065/80 (Skaare 1976:145)
Grave	11th century (Skaare 1976:145)
Grave	Viking Age
Grave	c. AD 900-950
Stray find?	6th-14th century
Grave	c. AD 1000-1050 (Risbøl Nielsen 1994:7)
Stray find	6th-14th century
Stray find	6th-14th century
Stray find	6th-14th century
Stray find	6th-14th century
Settlement	
Grave	c. AD 900-950 (Gjerpe 2005:40)
Stray find?	6th-14th century
Stray find	6th-14th century
Stray find	6th-14th century
Stray find	6th-14th century
Stray find	6th-14th century
Stray find	6th-14th century
Stray find	6th-14th century
Stray find	6th-14th century
Stray find	6th-14th century
Stray find	6th-14th century
Grave	c. AD 900 (Petersen 1940:156)
Grave	10th century (?) (Petersen 1940:155)
Grave	10th century (?) (Petersen 1940:159-60)
Grave	Late 10th century or early 11th (Martens 1969:93)
Grave?	-
Grave	c. AD 900 (Braathen 1989:55)
Grave	Late 10th century (Braathen 1989:56 and 99)
Grave	c. AD 850-900 (Petersen 1940:160)
Grave	10th century (Petersen 1940:157)
Grave	-
Grave?	c. AD 1000 (Steuer 1997:382)
Graves, mixed	-
Grave	Early 11th century (Braathen 1989:81)

Part II:

Silver, Trade and Towns

Kaupang from Afar: Aspects of the Interpretation of Dirham Finds in Northern and Eastern Europe between the Late 8th and Early 10th Centuries

7

CHRISTOPH KILGER

The settlement at Kaupang has proved to be uniquely rich in dirhams, quite on its own on the North Sea coast of Scandinavia. From stratigraphical evidence and comparative numismatic studies it has already been shown that dirhams were circulating in Kaupang in great quantity by the second half of the 9th century. These finds of individual coins differ from the evidence of hoards from Southern and Western Scandinavia, which on the whole appear only from the beginning of the 10th century. The coins found at Kaupang are in fact consistent with the dirhams found in Eastern Europe and around the Baltic of the 9th century.

This chapter seeks to analyse and to explain the individual finds of dirhams at Kaupang within a wider geographical and chronological perspective, taking account of the hoard finds from Northern and Eastern Europe. This study shows that the use of dirhams as silver bullion differed as it developed regionally, specifically in respect of the conventions and procedures established within the networks that were responsible for the distribution of silver. Thus the evidence of the dirham hoards not only provides evidence of contacts, but testifies above all to the acceptance of dirham silver in the particular region.

A regional analysis of finds, in which the inflow of dirhams is phased, is used to argue that the use of dirhams in Kaupang forms part of a longer-term sequence that began in the Southern Caucasus and Eastern Europe towards the end of the 8th century. The use of dirham silver gained a foothold in the Baltic area in the second quarter of the 9th century. In the course of the second half of the 9th century the use of dirham silver expanded to the West, to appear in a few coin hoards on the Continent and in Britain. It is further proposed that the significant upswing in the hoarding of dirhams after c. AD 860 – according to the *termini post quos* [t.p.q.'s] – reflects an increase in the inflow of silver from the East not hitherto recognized. The common notion that there was a silver crisis is challenged on methodological grounds. Interestingly, this increased supply does not appear in the form of dirham hoards in Southern and Western Scandinavia in this period in the same way as it does in the Baltic zone and Eastern Europe. Rather, it appears at sites such as Kaupang.

As a result, Kaupang may be regarded as a local entrepôt at which dirham silver was used in a way that probably increased in tempo during the second half of the 9th century and then lasted to the 920s or early 930s at the latest. At Kaupang, dirham silver was handled in various ways, as weighed silver bullion in relatively small units or in the production of larger units such as ingots. In this way, Kaupang played a crucial role in the distribution of silver in such larger unit-forms beyond the settlement during this period. With the arrival of Samanid silver in Southern Scandinavia in the course of the second quarter of the 10th century, the role of Kaupang was undermined and the use of dirham silver as weighed silver bullion came to be practised outside of the trading site. At this juncture, we find the first hacksilver and dirham hoards appearing in Southern and Western Scandinavia.

Figure 7.1 *Archaeological sites in South-Western Scandinavia with a high number of dirham finds (yellow). Distribution of dirham hoards in Southern Scandinavia (> 50 dirhams) and Western Scandinavia (> 5 dirhams), t.p.q. between c. 850 and 950 (red) (see notes 4–6). Map, Julie K. Øhre Askjem, Elise Naumann.*

Figure 7.2 *Distribution of hoards containing Islamic coins in Europe and Eurasia. Map, Elise Naumann, based on Jansson 1988:570, fig. 2.*

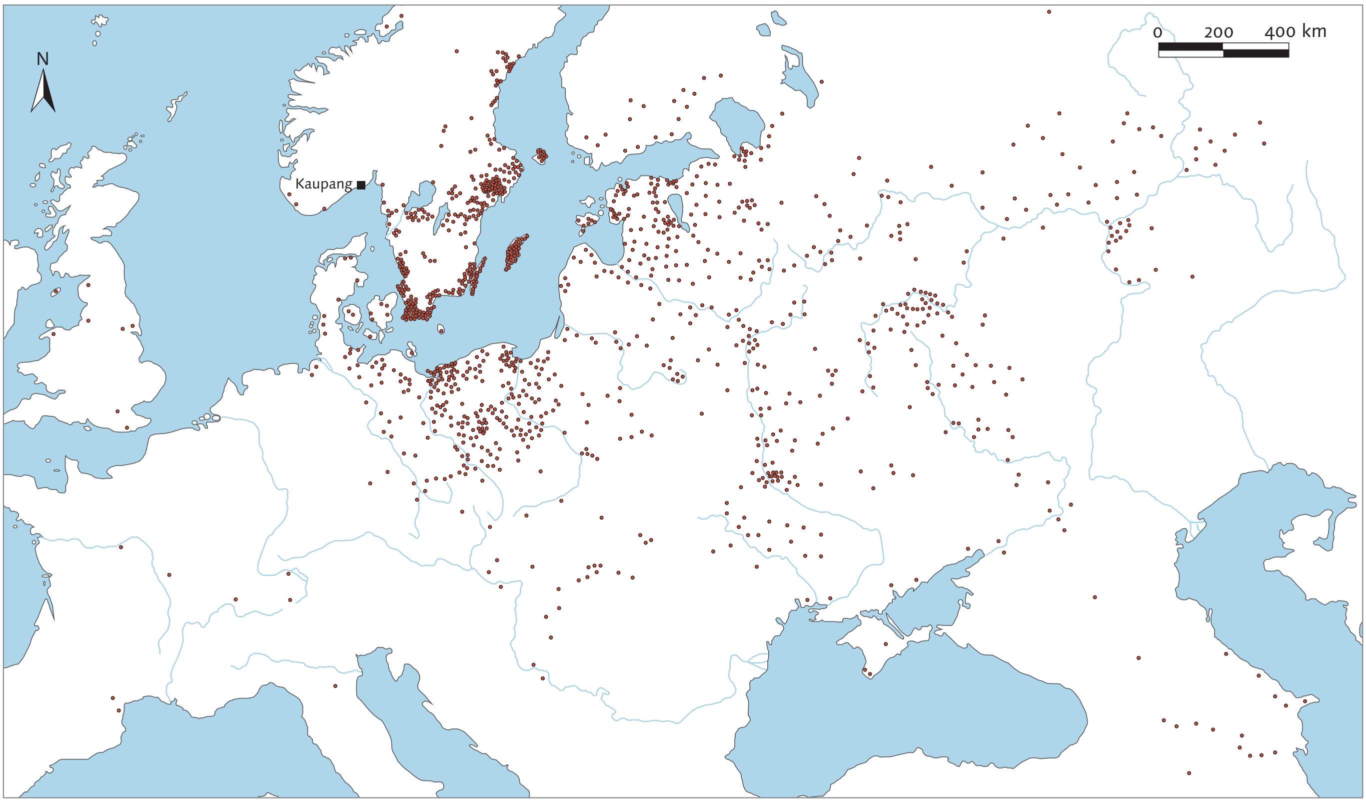
7.1 Introduction

The two campaigns of archaeological excavation in the settlement area at Kaupang that were carried out from 1956–74 and 1998–2003 produced 92 Islamic silver coins of the type known as dirhams. The dirham was used as the official coin of payment in the muslim-governed Caliphate which in the Viking Period extended from Spain in the west to what is now Afghanistan in the east. In addition to the dirhams, there are two Roman bronze coins of the 4th century, a Merovingian gold tremissis struck at Dorestad in the 7th century, two Byzantine bronze coins, five silver deniers/denars from Western Europe, and one Scandinavian coin struck in the 9th century. The dirhams are thus the predominant group of coins at Kaupang (Blackburn, this vol. Ch. 3.1, Tab. 3.1).

There is evidence of about 630 dirhams in Norway which can be attributed to Viking-period hoards, graves or settlements (Khazaei 2001:63–5, tab. X). If we start from the find-situation we are faced with at present, Kaupang accounts for about 15% of the total. As coins from a settlement context, the Kaupang dirhams have no parallel in Norway. In a wider geographical perspective too, the settlement finds from Kaupang stand out as being of great significance. Hitherto, there is no other known find place along the North Sea coasts of Scandinavia that can be compared with this dirham-rich settlement on the outer edge of the Oslofjord. It is first the so-called central places further south such as Uppåkra in Skåne and Tissø on Sjælland that show any comparable concentration of finds.[1] At Hedeby too, the most important trading site of Southern Scandinavia, there is a larger number of dirhams (Fig. 7.1).[2]

A comparison with the dirham hoards of Western and Southern Scandinavia provides another way of grasping the significance of Kaupang as a site where dirhams are found.[3] Two of the three largest hoards in Norway of the Early Viking Period are from the Oslofjord area, with Grimestad, Vestfold, lying in the immediate vicinity of Kaupang.[4] In all of the hoards, however, the number of coins is lower than in the find-assemblages from settlement contexts. Thus Kaupang also stands as the largest single collection of dirhams yet known in Norway. Again, we have to look further south to find hoards that can be compared with or even exceed the number of coins from Kaupang. Here, a number of massive hoards around the Kattegat come into view, most of all on the island of Sjælland (Fig. 7.1).[5] Some dirham hoards have also been found in Western Scandinavia, but these are, as a rule, small compared with the Southern Scandinavian hoards in the Oslofjord area, Skåne, and elsewhere in Denmark.[6]

We can be confident from the outset that the regional distribution of dirham finds we can see today



shows that Kaupang was an important site for the exchange and use of dirham silver in the North Sea zone during the Early Viking Period. This makes Kaupang a unique object of analysis for the investigation of the use of dirhams in this period. The aim of this contribution is to use Kaupang as a basis for a study of the significance of dirham silver in the exchange relationships during the 9th century and the early 10th in Northern and Eastern Europe. The goal is to place the distinctive features of the dirham evidence we have at Kaupang and elsewhere in Southern and Western Scandinavia within a larger geographical and chronological framework. In order to produce answers, the regional development of the use of dirham silver has to be examined. The work thus has to address a number of fundamental methodological questions relating to the analysis of dirham hoards. Mark Blackburn discusses the individual finds of coins from the settlement area of Kaupang in this volume (this vol. Ch. 3). The hacksilver and other silver objects such as rings and ingots are discussed by Birgitta Hårdh (this vol. Ch. 5). The large collection of weights is analysed by Unn Pedersen (this vol. Ch. 6). The present contribution should complement those studies by attempting to locate the occurrence of dirham silver at Kaupang in a wider European perspective.

Dirham finds from Kaupang

The areas around the Baltic Sea form the core area of dirham finds in Northern Europe and have held a

1 Uppåkra, 224 ex. (von Heijne 2004:253 and 289); Tissø, 101 ex. (pers. comm. Gert Rispling).

2 A total of 75 dirhams has now been recorded. To the year 2002, 38 specimens had been found (Wiechmann, in prep.). These probably include a small hoard from the Viking-age harbour area of nine cast dirham forgeries made of pewter (Steuer 2002:155–9). A recent metal-detector search conducted on the site has produced 37 further specimens (pers. comm. Volker Hillberg).

3 The geographical terminology used in this chapter is explained in section 7.2.

4 Grimestad, Vestfold, 77 ex. (t.p.q. 921/2); Teisen, Østre Aker, 63 ex. (t.p.q. 932) (Khazaei 2001:102). The t.p.q. of Teisen has been revised from 923 on the basis of a dirham issued in the name of Caliph al-Qahir billah (932–4) (pers. comm. H. Khazaei).

5 Dirham hoards with more than 50 coins, and t.p.q. c. 850–950 – Swedish and Danish hoards listed by von Heijne (2004:215–6): Sønder Kirkeby, Falster, 97 ex. (t.p.q. 846/7); Over Randlev I, Jutland, 242 ex. (t.p.q. 910/1); Neble, Sjælland, 200 ex. (921/2); Sigerslevøster, Sjælland, 54 ex. (t.p.q. 921/2); Bräcke, Skåne, 129 ex. (t.p.q. 921/2); Ramløse, Sjælland, 271 ex. (t.p.q. 932); Terslev, Sjælland, 1,750 ex. (t.p.q. 940/1); Grisebjerggård, Sjælland, 1,159 ex. (t.p.q. 942/3); Hammelev, Jutland, 122 ex. (t.p.q. 942/3).

6 Western Scandinavian dirham hoards containing more than 5 coins: Vela, Rogaland, 10 ex. (t.p.q. 930/1); Torgård, Sør-Trøndelag, 8 ex. (t.p.q. 862/3); Holtan, Sør-Trøndelag, 65 ex. (t.p.q. 950/1); Herten, Nordland, 18 ex. (t.p.q. 920/1). The t.p.q. of Herten could well be later, due to the presence of an imitation of a Samanid dirham (H 315?), which implies the year 927/8 (Khazaei 2001:201, No. 17); Rønnvik, Nordland, 46 ex. (t.p.q. 949/50) (Khazaei 2001:39).

primary place in research into Scandinavian contacts with Eastern Europe and the Caliphate in the Early Viking Period (e.g. Arbman 1955; Noonan 1994; Callmer 2000a, 2000b). On the island of Gotland alone, on the present count around 65,500 dirhams are known, while there are c. 16,700 from mainland Sweden and Öland (von Heijne 2004:23). In Western Scandinavia and areas of Southern Scandinavia, dirhams are a less prominent category of finds. Despite the rich collection of finds from Kaupang, Vestfold lies on the margin of a large area of Northern and Eastern Europe which began to introduce dirham silver as a standard of value in the course of the 9th and 10th centuries (Fig. 7.2).

Studies of the regional distribution of dirham hoards show that Southern and Western Scandinavia in the 9th century remain an area virtually devoid of finds in contrast to Eastern Scandinavia, parts of East Central Europe and Russia, which are rich in finds throughout both the 9th and 10th centuries. This situation changes during the 10th century as deposition in hoards increases markedly over the whole of Scandinavia (Sawyer 1971:110–12). By this stage Southern and Western Scandinavia had apparently become part of a super-regional circulation zone for dirhams that extended from the Caliphate to the North Sea lands. According to Kolbjørn Skaare (1976:47–9), who examined the coin finds of the Viking Period in Norway, dirham silver achieved its greatest importance in Western and Southern Scandinavia in the 10th century. This is despite the fact that a small number of dirhams did reach some parts of Norway as early as the 9th century. Skaare's conclusions are clear and uncontroversial in relation to a study of the dating of the dirham hoards. Nearly all such hoards that have been found in Southern Scandinavia in connexion with the North Sea zone are dated no earlier than c. AD 915. The exceptions are few. The larger examples, with more than 50 coins, are no earlier than c. 920.[7]

The early 10th-century find-phase represented by the hoards of Southern and Western Scandinavia is, however, entirely inconsistent with the coin finds from Kaupang. Already in the earlier excavations under Charlotte Blindheim's direction in 1956–74, a large number of coins had been recorded, including 21 dirhams, five Western deniers, and one Roman bronze coin. The Islamic coins at this point exclusively comprised dirhams of the Abbasid caliphs struck during the 8th and 9th centuries (Skaare

Figure 7.3 *Mints represented in the Kaupang material. Abbasid mints (red); Samanid mints post-892/3 (blue); other dynasties (yellow): Wasit – Umayyad mint; Amul – Alid mint; Tudgha – unknown Moroccan dynasty; Bulgar-Suwar – probable mint-places of the so-called Volga Bulgar imitations. Seven Samarkand dirhams from Kaupang (Rispling et al., this vol. Ch. 4:Nos. 45, 47, 57, 58, 61, 62, 83) were issued under a variety of dynasties, including the Abbasids, Tahirids and Samanids. Map redrawn by Julie K. Øhre Askjem, Elise Naumann after CNS 1.3:289.*

1976:139). Blindheim's excavations thus produced clear evidence that considerable quantities of dirhams struck before 900 could be found in Viking-period settlement contexts in Southern Scandinavia (Blindheim et al. 1981:183–4). In the most recent excavations and recording, between 1998 and 2003, sieving and metal-detecting has produced 71 more dirhams. The new finds support the view of an extensive circulation of dirhams in Kaupang before the 10th century. As in the collection from the Blindheim excavations, the overwhelming majority are 8th- and 9th-century Abbasid dirhams. However there is now also a small number of Samanid and Volga Bulgar dirhams struck in the 10th century (Blackburn, this vol. Ch. 3.1., Tab. 3.1).

In order to understand the distinct assemblage at Kaupang, with its high proportion of Abbasid dirhams, we need to take a closer look at the chronological grouping of the dirham finds of the Viking Period in Northern and Eastern Europe. In numismatic overviews, the Viking-period dirham hoards from the end of the 8th century to the end of the 10th have been divided into three chronological sets (e.g. Fasmer 1933; Welin 1956a; Yanin 1956; Noonan 1990). This classification is based upon an assessment of the composition of the hoards and how that changes over time. The earliest group of hoards, beginning at the end of the 8th century in the Caucasus and subsequently, in the 9th century, also found in Russia and Scandinavia, is dominated by dirhams struck by the Abbasid dynasty which came to power in the middle of the 8th century (below, Ch. 7.3–7.6). Abbasid dirhams were struck at mints in the Middle East, Central Asia and North Africa. The later group, which begins to predominate in the Eastern and Northern European dirham hoards during the first quarter of the 10th century, is composed almost entirely of Samanid dirhams from mints in Central Asia (Fig. 7.3). The Samanid emirs ruled as the caliph's governors in the provinces of Central Asia. The Samanids began to strike their own coins at the end of the 9th century. A third group consists of mixed finds of both Abbasid and Samanid dirhams representing a transitional phase from the importation of Abbasid coins to that of Samanid coins at the beginning of the 10th century (Noonan 1990:252; below, Ch. 7.7).

But what dynastic situation is reflected at Kaupang, and how is it to be placed in this chronological scheme? In order to assess the proportions of Abbasid, Samanid and other dynasties, the Kaupang dirhams are compared with other finds from Norway and, at a general Scandinavian level, with finds from Sweden. After Russia, Sweden – including Gotland and the medieval Danish regions of Skåne, Blekinge and Halland – has the highest quantity of Islamic dirhams in Europe (von Heijne 2004:23). The Swedish finds are also well documented, and for the most part have been studied numismatically.[8] They can consequently support an understanding of the quantitative relationship between dirham finds from the 9th century under Abbasid dominance and the 10th-century importation of Samanid coins at a general, Northern European level.

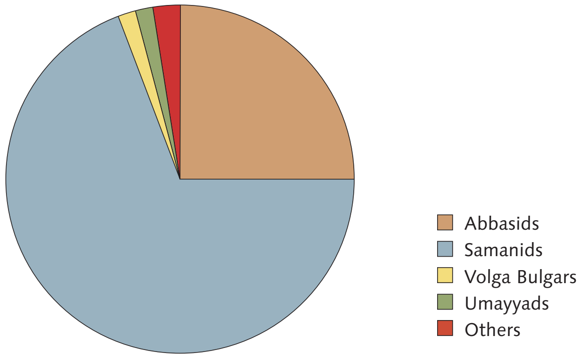
At present, information on 82,000 dirhams from about 1,690 Swedish finds has been collected, out of which 61,000 coins can be identified more precisely.[9] A tabulation of the dynastic association of all the Swedish finds shows the quantitative relationship between the Abbasid and the Samanid group. The Samanids make up c. 69% of the Swedish finds. Markedly lower is the proportion of Abbasid coins, at 25%, followed by the Volga Bulgars as the third largest group at 1.8%. The fourth largest group can be assigned to the Umayyad caliphate (Tab. 7.1, Fig. 7.4).

7 See notes 4–5. Slemmestad, Aust-Agder, four samanid dirhams (t.p.q. 915), Tab. 7.13. The exception is Over Randlev I, Jutland, 242 ex. (910/1) (von Heijne 2004:365–6). The Danish hoards are listed here in chronological order (von Heijne 2004:215–6).

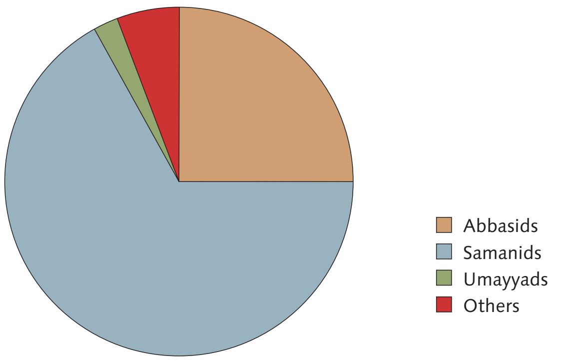
8 The numbers of the Swedish dirham finds are based on a catalogue edited by Thomas Noonan, but as yet unpublished. On the basis of Noonan's catalogue all the Swedish finds have been registered in a database at the Stockholm Numismatic Institute. Total numbers of individual coin finds and hoards have recently been published by Landgren (2004). Johan Landgren has kindly given me access to this database, which I have made use of in several places in this article. It is referred to in this chapter as "Landgren database".

9 The 14,200 specimens from the two huge, newly found hoards at Spillings were not included. The majority of coins have not yet been identified to numismatic standards.

Islamic dynasties in Swedish hoards



Islamic dynasties in Norwegian hoards



Islamic dynasties in finds at Kaupang

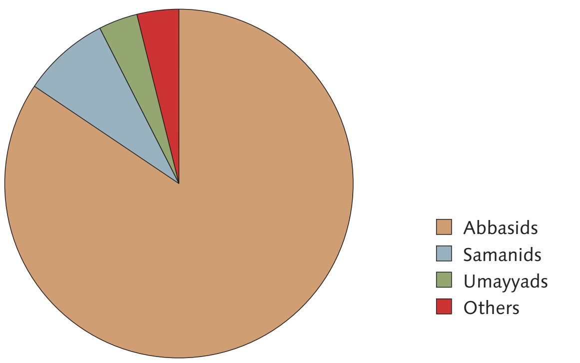


Figure 7.4 *Ratios between Islamic dynasties in Swedish hoards.*

Figure 7.5 *Ratios between Islamic dynasties in Norwegian hoards.*

Figure 7.6 *Ratios between Islamic dynasties in finds from metal-detecting and the archaeological excavations at Kaupang.*

Dynasty	Number	%
Samanids	38,523	69
Abbasids	14,201	25
Volga Bulgars	995	1.8
Umayyads	862	1.5
Buwayhids	492	0.8
Hamdanids	250	0.4
Saffarids	236	0.4
Tahirids	227	0.4
Uqaylids	107	0.2
Marwanids	90	0.2
Banijurids	86	0.1
Idrisids	39	0.06
Spanish Umayyads	33	0.05
Ikhshidids	20	0.03

Table 7.1 *Total numbers of coins of different Islamic dynasties found in Sweden (Landgren 2004:23, fig. 8).*

A preliminary tabulation of all the dirhams found in Norway has been published recently by Houshang Khazaei (2001). The Norwegian dirham finds are still being studied, but Khazaei's work is able to give us an approximate view of the ratios of Abbasid, Samanid and Umayyad dirhams at Kaupang and in the remainder of the Norwegian corpus (Tab. 7.2, Fig. 7.5).[10] I have decided not to take account of imitations, primarily of Volga Bulgar and Khazar dirhams, which have been much more fully studied in the Swedish finds. We cannot exclude the possibility that there are more Norwegian examples that have been recorded as official Samanid or Abbasid dirhams.

The dirham hoards from Norway other than at Kaupang show a virtually identical ratio in percentage terms between the Abbasid and the Samanid

Dynasty	Norway	%	Kaupang	%	Total	%
Samanids	302	66.2	7	9.1	309	58
Abbasids	116	25.4	63	81.8	179	33
Umayyads	11	2.4	4	5.2	15	3
Marwanids	4	0.8	-		4	0.8
Hamdanids	3	0.6	-		3	0.6
Spanish Umayyads	3	0.6	-		3	0.6
Saffarids	3	0.6	-		3	0.6
Uqailids	3	0.6	-		3	0.6
Buwayhids	2	0.4	-		2	0.3
Buyids	2	0.4	-		2	0.3
Banijurids	1	0.2	-		1	0.2
Hammudids	1	0.2	-		1	0.2
Ispahbads	1	0.2	-		1	0.2
Jafarids	1	0.2	-		1	0.2
Kharijits	1	0.2	-		1	0.2
Ziyarids	1	0.2	-		1	0.2
Idrisids/Moroccan dynasty	1	0.2	1	1.3	2	0.3
Tahirids	-		1	1.3	1	0.2
Alids	-		1	1.3	1	0.2
Total	456	100	77	100	533	100

Table 7.2 *Overview of dirhams found in Norway and Kaupang respectively, classified by the Islamic dynasties. Imitations and unidentified coins omitted (Khazaei 2001).*

groups as in the Swedish hoards. At 66%, however, the proportion of Samanid dirhams is a fraction lower. However the Kaupang dirhams' dynastic character is markedly different, with a large majority of Abbasid coins, making up about 82% (Fig. 7.6). At the same time, the high number of coins from the earliest dynasty of caliphs, the Umayyads (AD 661–750), at 5%, is of interest. Combining the Kaupang finds with the remaining finds from Norway would change the quantitative representation of the most common dynasties significantly, which is otherwise almost the same in both Sweden and Norway. These figures make a case for separating the finds from Kaupang from the other Norwegian finds.

The circulation of dirham silver in the settlement area of Kaupang appears to be concentrated in the period before 900. The few later coins indicate activity continuing into the 10th century to a more limited extent. Comparison implies that the importance of Kaupang as a place of exchange of dirham silver peaked in the 9th century rather than in the 10th. But the composition of the dirham assemblage at Kaupang does not stand out as unusual in a wider Southern Scandinavian perspective. Other find-rich settlements, such as Uppåkra in Skåne, which has been examined with metal-detectors in recent years, have a large majority of Abbasid dirhams struck during the 8th and 9th centuries (von Heijne 2004:253).

The early Viking-period trading sites as dirham zones

The increasing use of metal-detectors on Iron-age settlement sites in Southern Scandinavia since the 1980s has transformed our perception of Viking-period coin and silver finds (Moesgaard 1999:18–31; von Heijne 2004:45). It was likewise initially as a result of metal-detecting that the central places of Southern Scandinavia such as Tissø and Uppåkra came to notice as rich productive sites with Islamic silver coin (Silvegren 1999:99–104; Jørgensen 2003: 190, fig. 15.14). Before the sudden adoption of metal-detecting in the 1980s and the growing numbers of single finds of coins from settlement deposits our

10 Including grave finds (17) and single coin finds (14) with determinable dirhams listed by Khazaei (2001:40). Grave finds: 11. Bø, Sandnes (1 ex.); 14. Haugen, Hedrum (3 ex.); 30. Kjørmo, Lund (1 ex.); 32. Heigreber, Mosterøy (2 ex.); 37. Hopperstad, Vik (1 ex.); 39. Mo, Ørsta (1 ex.); 42. Setnes, Gryten (1 ex.); 58. Ner Bjørgen, Namdalseid (2 ex.); 60. Klinga (3 ex.); 65. Børøya, Hadsel (2 ex.); Single coin finds: 12. Huseby, Tjølling (1 ex.); 15. Mannevik, Brundenes (1 ex.); 29. Karmøy? (1 ex.); 31. Tjoraneset, Sola (1 ex.); 33. Sekse, Ullensvang (1 ex.); 36. Lillevang, Vik (3 ex.); 40. Masdal, Vartdal (1 ex.); 49. Strinda (1 ex.); 52. Værnes churchyard, Stjørdal (1 ex.); 55. Verdal (1ex.); 59. Innherad (1 ex.); 67. Bleik, Andenes (1 ex.).

attention was focused primarily on coins from graves and hoards. Indeed the graves by the settlement site of Birka had a prominent place in discussions of the importation of dirhams and the significance of silver coin in exchange relationships in the Early Viking Period.

Johan Callmer (1980) drew attention to the fact that coins in 10th-century graves at Birka are dominated by earlier, pre-Samanid dirhams, and thus differ sharply from the composition of hoards, which are dominated by Samanid dirhams. As an explanation of the differences between coins in grave and in hoards, Callmer (1980:204–7) proposed the hypothesis that there were two different spheres of circulation for dirham silver. Sites such as Birka functioned as special collection points for coined silver during the 9th and 10th centuries. At these sites the silver had a more economically directed role to play and was put to use in a well-developed exchange system. Through comparative studies, Callmer believed it was possible to demonstrate that coins in circulation at the trading sites were not intermixed with the hoards over a very long period. From about the second quarter of the 9th century onwards, a local stock of coin was accumulated which was subsequently used in transactions right through to the second quarter of the 10th century. This system was so effective that is was little supplemented with new silver in the form, for instance, of the Samanid dirhams that appear in great quantities in hoard finds at the beginning of the 10th century. Hoards away from the trading sites, by contrast, reflect, in Callmer's view, a less developed exchange system in which silver was accumulated in large masses without being used directly in transactions. To hoard silver in the "hoard societies" was less directly economically motivated, but governed first and foremost by the desire to increase one's prestige (Callmer 1980:206).

The idea of two distinct spheres of circulation has also been proposed by a number of other archaeologists in order to challenge the representativity of the dirham hoards so that they cannot be presumed to be so reliable for discussion of the extent and chronology of silver circulation in the Viking Period as otherwise has been supposed (e.g. Jansson 1985:180–1; Thurborg 1988:308). The distinctive composition of the Kaupang finds, being dominated by earlier Abbasid dirhams, would fit very nicely with Callmer's inference of a closed local coin-stock in circulation. The sphere-model could also be used to explain the great quantity of dirhams in the settlement area which is not mirrored at all in the few dirham hoards outside of the settlement. Kaupang could thus, along with other find-rich settlements of the Viking Period in Southern and Eastern Scandinavia, have functioned as a sort of enclave for the handling of dirham silver within a specialized economic system. This would apply equally to other "classic" trading sites such as, for instance, Hedeby and Birka, which have been characterized as "nodes" (Sindbæk 2005:70–98). Transregional, long-distance trade was channelled and coordinated through these nodes in the Viking Age. Here one could obtain and re-deploy silver in the same way as in the Viking-period trading sites which begin to develop in many places in Scandinavia at the end of the 8th century. To this extent, I believe that Callmer's model is highly relevant to an understanding of the concentrated use of dirhams at sites such as Birka, Kaupang, Tissø and Uppåkra.[11]

However, Callmer's conclusions rest upon a series of premisses that in my view need to be considered more carefully; above all, that the hoards and the coin-finds from the settlement sites represent different spheres of circulation that did not come into contact with one another. The idea of different spheres of circulation has wide consequences for comparative studies of different categories of finds of coin. Callmer's sphere-model implies that the dirham hoards cannot be interpreted in the same way as coin-finds from Viking-period trading sites. The model has, as a result, been used principally by archaeologists as a source-critical argument that hoards with coins are not intrinsically representative so as to be able to support a comprehensive assessment of the circulation of coins and silver in the Early Viking Age. At the same time one puts brackets around the coin-finds from the trading sites and alleges that they do not necessarily directly reflect the importation of dirham silver from the East. Instead, they represent, as in the case of Birka, a closed system involving the local reuse of old coined silver over a period of about a century. It is my belief, however, that the chronology of the dirham hoards, their composition and their regional distribution, have not been investigated in sufficient detail to justify a categorical separation of distinct spheres of circulation of dirham silver such as Callmer and other scholars have proposed.

Callmer has nonetheless put his finger on a series of key points concerning both the use and the importance of dirham silver in Scandinavia in the Early Viking Period. These relate to the discussion concerning the chronology of the importation of dirhams from the East: in other words, the relationship between the Abbasid imports of the 9th century and the Samanid imports of the 10th. Why did the supply of Samanid coin have such a late impact at Birka and none at all at Kaupang? Another issue is the significance of sites such as Birka and Kaupang in the exchange and handling of coined silver at both regional and local levels. Do these sites really embody an economic system closed off to their hinterlands in respect of the use of dirham silver? In order to answer these questions, it is also necessary to study the regional development of the use of dirham silver outside of Kaupang, Southern Scandinavia and Birka.

Here, the sphere-model provides us with interesting starting points as it links up different categories of coin-find as well as different empirical and theoretical questions within the numismatic and archaeological evidence base.

The dominant 10th century

In studies of the use and significance of silver in the Viking Period, three overlapping periods have been identified in respect of super-regional dirham-exchange, and these have been incorporated into a series of historical, archaeological and numismatic overviews (Sawyer 1971:86–119; Spufford 1988:65–73; Noonan 1997; Roesdahl 2001:122–4). At the same time, these periods have been integrated with a broader cultural historical understanding of the Early Viking Period. The first period concerns the beginning of the inflow of dirhams and the establishment of contacts with Russia during the 9th century. The dirham finds represent the beginning of the Viking-period expansion to the East. The second period concerns the inflow of Samanid silver in the first half of the 10th century. The Samanid dirham period reveals the large-scale use of silver in the Scandinavia and the establishment of a silver economy based on standardized weights and balances (Steuer 1987:459–69, 479, 1997).

Towards the end of the 9th and during the 10th century we also find more comprehensive and substantial evidence in hoards for a large-scale and diverse silver-jewellery industry in Scandinavia and the Slavonic regions (Duczko 1985:111–12; Hårdh 1996:65–72, 2004:213–14). Dirhams probably provided the quantities of silver needed for producing heavy rings and other jewellery (Arrhenius et al. 1973). The transition to the importation of Western European coined silver in the second half of the 10th century has been identified as a third period (e.g. Jonsson 1990). In this case, emphasis is placed on the demise of, for instance, Birka, and the transformation of both social organization and the traditional pattern of exchange that such sites represented in Early Viking-age society (Callmer 1994:72).

The periods outlined here, which reflect the fluctuations in the flow of coined silver from Russia, tend on the whole to represent the situation in the dirham-rich eastern regions of Scandinavia, i.e. what is now Sweden and the territories with direct access to the Baltic Sea zone. From the Baltic region as a whole we currently know of about 70 dirham hoards that can be dated to the 9th century. In Southern Scandinavia, what is now Denmark, Norway and the southern parts of Sweden such as Skåne, Bleking and Bohuslän, there are only five hoards of dirhams recorded from the same period (see Checklist of Dirham Hoards: below, 7.10). In almost all of these hoards the dirhams have been reworked as jewellery or comprise only a tiny fraction of the total amount of silver in the hoard. Instead of coins, silver seems to have been valued in the shape of rings and ingots. The coinless ring and ingot hoards – which are difficult to date closely – start to appear in Southern Scandinavia in the 9th century (Skovmand 1942:28–43, tab. 10). The distribution of non-minted silver hoards seems mainly concentrated in this period in the South, on the Danish islands and in Jutland.

The situation changes significantly with the earliest occurrences of dirham hoards in Southern Scandinavia in the first quarter of the 10th century. It is interesting that the inception of what Birgitta Hårdh identifies as the "hacksilver period" coincides with the appearance of the dirham hoards (Hårdh 1996: 92–3). On the basis of these hoards, Southern Scandinavia has been identified by Hårdh (1996: 170–1, 2004:215–16) as an area of innovation in respect of the use of hacksilver. In Western Scandinavia, the regions in what are now Western and Northern Norway, both hacksilver and ring hoards seem to occur later, and to belong on the whole to the 10th and 11th centuries (Grieg 1929:200–29 and 230–64). It is not, however, possible to rule out the inception of hoarding of large amounts of silver in this area by the end of the 9th century.[12] The few dirham hoards in Western Scandinavia, which are usually small collections, occur more regularly from AD 920 onwards.[13]

Analysis of the hoard evidence in Southern and Western Scanadinavia suggests that the use of silver on a considerable scale began on the eve of the 10th century. However, the most recent investigations in the settlement area at Kaupang have produced a series of new and unexpected find-contexts. Uncoined hacksilver appears in a stratigraphical context that can be dated to the second quarter of the 9th century (Hårdh, this vol. Ch. 5:114). Dirhams have only been found in the unstratified context of the ploughsoil (Pedersen and Pilø 2007:188).This means that the large quantity of 8th- and 9th-century

11 When Callmer wrote his article in 1980, the central places of Southern Scandinavia were neither known to nor discussed by archaeologists. Callmer made use of the sphere model primarily with a view to characterizing the economic relationship between the classic Viking-period trading sites and their hinterlands.

12 The chronology of the early ring hoards of Western and Northern Scandinavia is uncertain, owing to the lack of coins. Jewellery hoards are generally dated to the 10th and 11th centuries. James Graham-Campbell (1999) has recently discussed plaited and twisted ring-types in both gold and silver, which are the most common type of neckring in Western Scandinavia and are generally dated to the 10th century. He suggests that the plaiting technique originated in the Danish area in the course of the 9th century.

13 See note 6. The exception is the tiny hoard of Torgård, Sør-Trøndelag.

dirhams would appear to have been circulating in the settlement area from the 850s onwards at the earliest (Blackburn, this vol. Ch. 3:52–3; Pedersen and Pilø 2007:184–6). The excavations in Kaupang have also revealed extensive metalcasting involving lead, silver and gold. Ingots of bronze, lead and silver have been found, and moulds for ingots (Pedersen, in prep.). Amongst the dirham finds, a lump of silver composed of hacksilver and some eight half-melted dirhams stands out (Blackburn, this vol. Ch. 3:Fig. 3.1). This provides some evidence that amongst other uses, dirhams at Kaupang were employed as a source of material for the silversmith.

From a southern and western Scandinavian perspective it is evident that the use of silver during the 9th century – either as unminted silver, as hacksilver or as Islamic dirham silver - has been regarded as less of a problem. This is because before the finds were made at Kaupang and Uppåkra, attention was focussed almost exclusively upon the dirham hoards and their 10th-century date. Here, then, we run into the difficulty of analysing and interpreting numismatic and archaeological sources of evidence together, and of locating them within a common cultural historical framework. The Kaupang finds are able to change this situation and to afford us an insight into the use of dirhams in the 9th century, something which will also, then, influence our understandings of hacksilver, of the introduction of standardized weighing equipment, and of the significance of the ring hoards without coins of Southern and Western Scandinavia. I shall discuss that more fully in my next contribution to the present volume (Kilger, this vol. Ch. 8).

The questions

It seems likely that the situation that comes so clearly into view in a number of different contexts in the 10th century, where silver was being used in large quantities and in various circumstances, was the result of a longer-term development running some way back in time. The whole situation in respect of dirham finds in Southern Scandinavia seems to be full of contradictions. The examination of the numismatic composition of the dirhams from Kaupang and Uppåkra in Skåne indicates a role for Abbasid dirham silver in the 9th century which did not leave any traces in the form of dirham hoards outside of those sites. Instead, we have ring and ingot hoards, that with very few exceptions contain no dirhams. It is not before the 10th century that dirham and hacksilver hoards emerge as a distinct category of find, both in Southern and in Western Scandinavia.

We have not really been able to establish if there is any connexion between the large quantities of 9th-century dirham hoards in the Baltic area and the occurrence of what are usually coinless ingot and ring hoards in Southern and Western Scandinavia in the 9th and 10th centuries. The settlement finds from Kaupang now form a bridge between a number of categories of find which otherwise appear separately in hoard and other find-contexts. But the chronological connexion between these categories of finds is still unclear. As I have shown, the dirhams form a central group of finds which have rarely – except in the case of Birka – been studied methodically in their archaeological context (for Birka, see Gustin 1998, 2004a, 2004b; Jonsson 2001). Unfortunately, the layers that originally contained the dirhams at Kaupang have been disturbed, so that we have only approximate indications of when the dirhams began to turn up here and over what length of period they were used in the settlement area.

The principal questions I wish to answer in this chapter can thus be formulated as follows:

- In what way can the dirham hoards be used as a source to shed light on the transfer of dirham silver in Scandinavia and the Baltic Sea zone during the 9th and early 10th centuries?
- Why do dirham hoards first appear in Southern Scandinavia at the beginning of the 10th century while in Eastern Scandinavia and around the Baltic there are many hoards of the 9th century?
- How can the low quantity of Samanid dirhams at Kaupang be explained, although the settlement seems to have flourished during the first half of the 10th century?
- And finally, what role was played by sites in Southern Scandinavia such as Kaupang, which were obviously nodal points for long distance trade in their own regions? Do these sites really embody an economic system closed off to their hinterlands in respect of the use of dirham silver?

In order to understand the special context of dirham finds in Southern Scandinavia and at Kaupang, we need to examine the development of dirham-exchange in the central regions for 9th century dirham finds in Eastern Europe and the Baltic Sea zone. The main sources we have to rely on in this respect are the dirham hoards. We will take a closer look at these in the coming sections before we return again to Kaupang.

7.2 Phasing

This section contains an attempt to phase the importation of dirhams into Eastern and Northern Europe across the 9th century and early in the 10th. The phasing that is derived primarily from the occurrence of Abbasid dirhams is merely in sketch form, with only individual but prominent features emphasized. It is based principally on observable changes in the composition, and on the geographical distribution of dirham hoards. It is thus an attempt to highlight the significant elements of both chronological and re-

	770	780	790	800	810	820	830	840	850	860	870	880	890	
Western Europe (7)			3						1	1	2			7
Southern/ Western Scandinavia (6/1)		1		1				1	1	2	1			7
Eastern Scandinavia/ Finland (50/1)			1	1	4	1	7	2	6	12	7	6	4	51
Central Europe (21)			1	3	9	1		1	2	2		1	1	21
Eastern Europe (77)		2	4	7	13	6	5	8	2	22	6	1	1	77
The Caucasus (23)	2	4	1	4	3	3	3		1	1			1	23
	2	7	10	16	29	11	15	12	13	40	16	8	7	186

Table 7.3 *European hoards containing dirhams, t.p.q. 770–900, according to location.*

gional importance. The general perspective also takes account of coin hoards from the monetized areas of Western Europe that occasionally contain dirhams.

A general summary of the finds

Finds from every part of Europe have been reviewed in order to reveal the general trends. The histogram here (Fig. 7.7) offers a comprehensive tabulation of the latest coin dates of 186 hoards containing dirhams from Europe within the 8th and 9th centuries (Tab. 7.3). This corresponds to phases I–IVa (below, 7.3–7.6). However I have not systematically included dirham finds that are dated post-896 and which may include higher or lower proportions of Samanid dirhams. The inception of the importation of Samanid coins, phase IVb, and the nexus of problems surrounding the Samanid-dominated hoards, will be taken up in more detail in a separate section (below, 7.7) focused on the first decades of the 10th century.

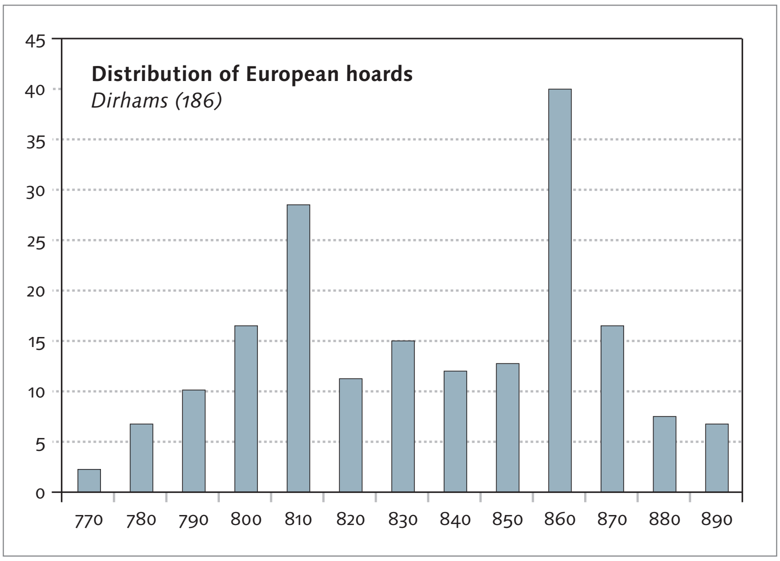
The period from c. 770 to 920/930 is divided into five phases amongst which it appears justified to locate the individual hoards. A similar phasing of the Russian finds based principally on numismatic criteria has already been published by Noonan (1984a). The database excludes hoards of fewer than five coins.[14] A minimum number of five coins yields statistical reliability for an analysis of the composition of the dirham hoards (Noonan 1994:221). Grave finds of dirhams and very small dirham hoards have not been included in the analysis. The hoards on which the present study is based are listed in a catalogue, classified by region and t.p.q. (below, 7.10).

Geographical terminology

In this text I discuss finds including Islamic coins from various regions of Europe. In so doing, I shall use general geographical designations which correspond to a number of present-day states.

14 An exception is Hässelby, Gotland (t.p.q. 796/7) with three coins that constitute the dirham hoard with the earliest latest coin on Gotland (Fig. 7.10–7.11).

Figure 7.7 *Chronological distribution of European hoards with dirhams of the 8th and 9th centuries according to t.p.q.*



The Caucasus: Armenia, Azerbajdzan, Georgia, and southern parts of modern-day Russia.
Eastern Europe: Russia, Belorus, The Ukraine, and the Baltic states.
Central Europe: The eastern parts of Germany, Poland, and Romania.
North-Western Europe: France, Belgium, The Netherlands, Great Britain, and Ireland; apart from Ireland, this corresponds to the Anglo-Saxon kingdoms of England and the Frankish realm, where monetization was fully established.
The Southern Baltic Sea zone: refers primarily to the find-rich coastal regions of Eastern Germany and Poland.
Northern Europe: Norway, Sweden, Denmark, and Finland.
Eastern Scandinavia: comprises mainland Sweden and the Baltic islands of Gotland, Öland, Åland, and Bornholm.
Southern Scandinavia: Skåne, Halland, Bohuslän, the Oslofjord region, the Danish islands (except Bornholm), Jutland, and Schleswig-Holstein.
Western Scandinavia: regions of Western and Northern Norway.

Methodological principles

Sebastian Brather (1997:85–90) has laid out a series of arguments based upon methodological and source-critical foundations that oppose over-general interpretations of the dirham finds which tend to ignore the fundamental mechanisms of the importation of these coins. Amongst other things, Brather has attempted to show the analytical potential, albeit with, to an even greater extent, the methodological limitations, of using latest coin dates (t.p.q.) and the composition of coin-finds. The varying frequency of latest coin dates in hoards that can be seen in the histogram (e.g. Fig. 7.7) cannot be used as a direct indication of phases of importation or as a basis for describing the intensity of contacts between the Islamic world and Northern and Eastern Europe. Increases and decreases in the frequency of deposition are primarily reflections of phases of minting and of the number of dirhams that were in circulation in the Caliphate (see below, p. 222). He also points out the difficulty of dating contacts between areas on the basis of coin-finds in light of the long period of circulation for dirhams that we must always reckon with. In addition to this, the flood of coins from the Islamic world to Eastern and Northern Europe was influenced by many factors that render it difficult to reach any single view of the contacts or exchange relationships within this extensive area. It is therefore also hard to judge just how representative our finds actually are. Altogether, it seems dubious to create shorter phases of dirham importation down to intervals of two or three decades. Such phases can be found, but are difficult to justify from the coin-finds for methodological reasons. Brather proposes phases of 80–100 years instead.

Brather's fundamental source-critical approach is highly justified, but I nevertheless believe it is possible to outline narrower phases in the importation of dirhams, even if they are hard to trace. It is precisely the regional differences in the deposition of hoards, of which an account was given at the start of this chapter, that render it desirable to work with a finer chronology and a more searching analysis of the importation of dirhams in the 9th century. The reduction in minting in the Caliphate in the first half of the 9th century, which is one of the key planks in Brather's argument against a finer chronology, was of shorter duration than is commonly supposed. Fundamental numismatic research of recent years has also provided us with new ways of dating dirham hoards from this critical period (see below, pp. 224–5). The greatest challenge to sorting out the chronology of the dirham hoards, however, is the long circulation period for dirham silver, which can affect our interpretation of the significance of the t.p.q.'s of the hoards. Thus, the t.p.q.'s thus need not necessarily give us a direct indication of either the date of importation or that of deposition. A factor that lies behind our ability to assess the period of use in the area of deposition – and one which is absolutely crucial – is, in my opinion, how the exchange of coined silver was organized in the Viking Period.

Within the dirham period, we have to allow for relatively long periods of circulation that are not immediately perceptible in the finds we have. What is essential for an assessment of the coin-finds is to determine when dirhams were introduced to the area in which the find has been made. It is less important to be able to pinpoint the exact date at which any particular hoard ended up in the ground, something that has often been the centre of attention, particularly in the critical debate over how reliable the t.p.q.-figure may be. There is no reason why there should be any direct connexion between the period of use in the coins' original monetary region and the period of use of the coinage in the areas in which it came to be deposited in Northern and Eastern Europe. To use a numismatic expression, we should distinguish categorically between the date of minting in the place of origin and the dates of both importation and circulation in the place of deposition.

The phasing I present here works with short periods of 20 to 40 years. The date-boundaries of the phases are based initially on the t.p.q. of the hoards. As I would emphasize, both the phases and the calendrical dates assigned to them are to be treated primarily as a matrix within which the hoards can be located in relative terms, both chronologically and geographically. The phasing is of less validity for determining the period over which the coins were used in the area of deposition. In some cases it is not possible to rule out a particularly long period of circulation that is not revealed by the latest coin date.

The criteria I make use of for the construction of this matrix are firstly the information that is embodied in the composition of the hoards, such as the regional range of mints in the Caliphate, the occurrence of distinct groups of coins, the age-structure, and size. Another important indicator is the varying regional distribution of hoards. A third criterion by which the 9th-century dirham finds can be grouped chronologically is the test-marks typical of dirham silver called "nicking". A fourth criterion by which the period at which the dirhams were imported to particular regions can be determined is the presence of coin-finds from stratified or other closely dated contexts. A marginal, but chronologically highly dependable category of finds is hoards with dirhams from the monetized areas of North-Western Europe where the dating of the dirhams can be compared with other Western European coins in the assemblages. The find-spots of these are usually immediately associable with the areas of minting and use of the European coins.

The purpose of this phasing is primarily to show changes in the flow of dirhams from the East, and how that may be related to the particular pattern of finds of dirhams we have at Kaupang and in Southern Scandinavia. The phases will in all probability come to be modified for the various dirham-using regions of Eastern and Northern Europe. Rather than a trans-regional chronology of dirham imports, such as I present in this paper, it will probably prove possible to establish different chronologies of the importation and circulation of dirhams for various areas of Scandinavia and the Baltic Sea area. This will be possible when the quantity of archaeologically investigated sites with large numbers of individual finds of dirhams grows to the point at which they can be compared with the silver hoards from the same region. In an ideal situation we shall have stratigraphically excavated and thus well-dated contexts for the finds, as we have at Birka, Ribe, and now Kaupang too.

7.3 The Caucasian link (Phase I, t.p.q. 770–790)

The earliest finds of Islamic coins in one of the eastern border zones of Europe are from the last quarter of the 8th century. These are above all in locations in the Southern Caucasus where there are a few hoards of dirhams alone (Noonan 1980:402, map 1, 407). It is on the basis of the distinctive regional distribution of finds that in this section I shall review a number of questions that relate to the interpretation of the earliest dirham hoards.

As we can see from Table 7.4, the evidence of the finds from Phase I shows little relationship with that of the distribution of dirham finds from the classic Viking Period as it emerged post-800 in Northern and Eastern Europe. The Southern Caucasian hoards of Eurasia stand out as a locally peculiar and chronologically well-defined set of finds compared with occasional hoards that also appear in the areas of Russia and Scandinavia.

	Number of finds	Dirhams	Largest dirham hoard
Baltic islands	-	-	-
Southern Baltic coast	-	-	-
Western Scandinavia	-	-	-
Finland (mainland)	-	-	-
East Central Europe	-	-	-
Southern Scandinavia	1	(4–7)	(4–7) Ribe
Eastern Europe	2	34	31 Staraia Ladoga
The Caucasus	6	335	187 Gandza
Sum	9	376	
Western Europe	-	-	-
Sum	-		

Table 7.4 *The regional distribution of dirham hoards, phase I (t.p.q. 770–90).*

An inverted view of transit trade

It is from the last quarter of the 8th century that we have examples of dirham hoards from the Southern Caucasus (Noonan 1980:407; Fig. 7.8). Towards the end of the 8th century this area developed into a crucial link in the trade involving dirhams between the Caliphate and Eastern Europe (Noonan 1984b:165). Trading relationships were able to develop in the Eurasia that lay within the Islamic sphere of interest after the long conflict between the Khazars in the Northern Caucasus and the Arabs of the Caliphate was settled and succeeded by peaceful contacts. A political and economic rapprochement between these kingdoms developed over an extended period in the second half of the 8th century and in the early 9th (Noonan 1981:51–2, 2001:143–4).

One indication that the Caucasus was the earliest link in the chain of exchange of dirham silver between the Caliphate and Eastern Europe is found in the composition of the early dirham hoards (Noonan 1984b: 158–71). Comparative studies of compositions show that Eastern European hoards are almost identical with contemporary dirham finds from the Middle East (Noonan 1980:446). Hoards in both areas contain a relatively high proportion of coins, around 25%, struck by non-Abbasid dynasties (Noonan 1986: 128). Their composition thus diverges markedly from that of other finds in the eastern provinces of the Caliphate in Central Asia. A Central Asian source for the early Eastern European finds

would thus seem to be quite implausible (Noonan 1981:51). Dirhams from the central regions of the Caliphate in the Middle East should, therefore, with all probability have passed through the Caucasus on their way to Eastern Europe.

Another piece of evidence is the fact that many early Russian hoards have a latest coin from a mint-place in the Southern Caucasus (Noonan 1984b: 158–9).[15] Coin-production in the Southern Caucasus, however, was markedly reduced after c. 810, and from that time it loses significance as a means of tracing the area of distribution of dirham silver towards Northern and Eastern Europe (Noonan 1984b:162–3). This situation is probably connected to the generally negative trend in coining in the Caliphate at the same time (below, 7.5). From the middle of the 9th century onwards, the Caucasus seems to have lost its dominant position as a transit area. This conclusion is based upon the observation that the marked increase in deposition in Northern and Eastern Europe after c. 860 cannot be matched in the Caucasus (Tab. 7.3). Dirham hoards disappear there. The contacts were then probably relocated to other routes that gave direct access to the Caspian Sea and the lower Volga region. It is also at this time that Russian merchants are mentioned for the first time in Arabic sources (Noonan 1984b:165–6).

According to Noonan, deposition in the Southern Caucasus area was a phenomenon that arose in the wake of the growth of transit trade with Eastern Europe. Indirectly, it is an indication of the growing circulation of dirhams in this area (Noonan 1984b: 170–1). Noonan's idea of the Caucasian link offers us many important insights by which we can set the Eastern and Northern European dirham hoards of the early Viking Period into a wider context. But the large-scale geographical perspective provides little space for one to look at and analyse this deposition as an autonomous practice that was the result of ideas and practices in the area of the finds itself (Kilger

Figure 7.8 *Distribution map of dirham hoards, t.p.q. 770–790. (The finds and their distribution are shown in Brather 1997.) Map, Julie K. Øhre Askjem, Elise Naumann.*

2005). Rather, the distribution of finds is interpreted in terms of trade routes in relation to which the dirhams were deposited for whatever reason while on their determined way to Eastern or Northern Europe. The transit model has also proved, for many general histories, a reliable construction enabling one to put the Viking-period expansion towards the East in a fully European perspective (e.g. Bolin 1953; Hodges and Whitehouse 1983). The dirhams were moved from area to area by means of external stimuli and agents. It was foreign groups, such as Vikings or Russian merchants, who played a leading role in the exchange relationships and who controlled this transit trade (e.g. Arbman 1955). However I believe that the idea of transit also presupposes use of dirhams in the region to which they came. In the first dirham phase, as a result, the Caucasian finds should be matched by a comparable quantity of hoards in Eastern Europe but this is not the case.

From the dates of the latest coins, there is just one hoard from Russia that matches the earliest cluster of finds in the Caucasus chronologically. This is the famous hoard at Staraja Ladoga (t.p.q. 786/7) that was found at the end of the 19th century outside the well-known Viking-period settlement in N.W. Russia. This small but well-documented find of 31 dirhams has quite a compact composition, chronologically, with the range between the earliest and the latest coin being less than 40 years (Noonan 1980:420, 1981:82). The few other Russian finds from the end of the 8th century are poorly recorded in terms of provenance, and generally inadequately documented (Brather 1997:93 n.147).[16] It is not before the first decade of the 9th century that a number of finds form a coherent and consistent set in this area.[17] From the latest coin dates, we can see a clear chronological gap of about twenty years between the Caucasian and the Russian horizons. With the exception of Staraja Ladoga, there is thus no immediate historical connexion between the Caucasian and the Russian hoards. If there had been some organized transit trade involving dirhams such as Noonan proposed, more hoards should have been found in the area of Russia with t.p.q.'s in the 780s and 790s.

If we move our perspective on the finds westwards to Scandinavia, we encounter a find-situation similar to that in Russia. Another find that should be evidence for an earlier appearance of dirhams in an 8th-century context in Scandinavia is a small hoard with forged dirhams that has been found in a stratified layer at Ribe.[18] This layer has been dated dendrochronologically to the 780s (Feveile and Jensen 2000:24, fig. 6). A dirham found on its own has been recorded at Birka in a layer of the late 8th century or beginning of the 9th (Gustin 2004b:98; Rispling 2004a:55, no. 102). From Groß Strömkendorf in the West Slavic area, too, we also have a small number now of 8th-century dirhams (pers. comm. Lutz Ilisch). In this connexion we should also note that there are a number of women's graves from mainland Sweden and from Norway that contained a considerable number of 8th-century dirhams,[19] or imita-

15 Further critical questions concerning the method of using the most recent mints in a hoard to reconstruct transit-routes were previously discussed by Noonan (1980:404–6).

16 Hoards such as Glazov (t.p.q. 784?), Ungeni (t.p.q. 792/3), and Penzlin (t.p.q. 798/9) have been considered unreliable in this respect. The same problems also apply to the larger hoard of Novye Mliny (t.p.q. 795?) which has also largely been dispersed (Noonan 1981:59 and 82).

17 E.g. Tsimliansk (t.p.q. 799–807), Krivianskaia stanitsa (t.p.q. 807/6), Kniashchino (t.p.q. 808/9) and Zavlishino (809/10) (Noonan 1984b:154–6).

18 The tiny hoard from Ribe is completely corroded but contains probably between four and seven coins. Two of the specimens which have been identified, lying on the outer surface on either side, are identical copies of an Umayyad dirham issued H. 81, AD 700/1 (Feveile and Jensen 2000:24, n.10). According to Rispling, imitations of dirhams – inside and outside the Caliphate – are first documented after the year 835. Thus the dirhams should be regarded as forgeries of some kind rather than imitations (pers. comm. Gert Rispling).

19 This applies first and foremost to the much discussed grave-find from Tuna i Alsike, Uppland, with eight dirhams (t.p.q. 784/5). The admixture of grave goods from other burials in the same cemetery cannot be ruled out (pers. comm. Björn Ambrosiani). As it would now appear, in addition to the coins, the grave assemblage contained female jewellery: a pair of oval (tortoise) brooches of JP 37. The beads include polyhedrical cornelian beads. Brooches of type JP 37 are dated to the 9th century (Jansson 1985; Skibsted Klæsø 1999), and cornelian beads of the polyhedrical type to the second half of that century (Callmer 1977).

tions thereof.[20] It is striking, however, that all of these graves are dated by find-assemblages of, inter alia, beads and brooches to the 9th century.

The datings of the secure dirham deposits show that there is a chronological disjunction between the earliest evidence of finds in the Caucasus on the one hand and those in Northern and Eastern Europe on the other. The earliest deposits in Russia and Scandinavia are harder to assess and the problems in using this evidence need to be discussed more thoroughly on another occasion. However there is clear evidence that small quantities of dirhams were in circulation in the North-West of Russia and probably also at nodal points in the Baltic Sea zone such as at Staraja Ladoga before 800 (Callmer 2000b:62), and at Birka around the year 800 (Gustin 2004b:97–8).

Conclusions

The earliest dirham finds in areas immediately adjacent to Europe are from the last quarter of the 8th century in the Southern Caucasus. This region was a monetary border-zone between the Caliphate to the south and the Khazar kingdom to the north. Although isolated dirhams can be identified at the end of the 8th century with the help of independent stratigraphical datings in Ribe and Birka, these coins have no substantial presence in the archaeology of these regionally important trading sites. The same conclusion may be drawn with regard to the occasional hoards such as that at Staraja Ladoga. These can therefore scarcely be used as evidence of regular contacts with the dirham-using areas both within and around the Caliphate.

Noonan's concept of a Caucasian link based upon numismatic arguments is, despite my criticism of the transit model, still very persuasive. But one can question whether the few finds can really be used to support wide-ranging conclusions concerning, for instance, the existence of large-scale dirham transit trade as early as the end of the 8th century (e.g. Brather 1997:91–4). Other scholars have proposed that there may have been some importation of dirhams to Scandinavia during the 8th century which would not necessarily be visible in hoards (Welin 1974; Jansson 1985:180, 1988:569). The motivation of their arguments has been, as for Noonan, to discuss the beginning of contacts with the Islamic world. I believe, however, that the dirham finds have to be looked at from another viewpoint. The more interesting question is when the exchange of dirhams came to take place in a more organized way, and what the reasons for that were. The chronological gap between the Caucasian and the Russian hoards may well indicate a change in the way dirhams were used in the area of Russia. That was the point at which the hoards appear. As far as the earliest hoards in the Southern Caucasus are concerned, those dirham finds do not just reflect transit trade, routes or contacts, but also the use of coined silver in some way or another in the area in which it came to be deposited.

We cannot exclude the possibility that dirhams were melted down in Eastern Europe at the end of the 8th century in order to produce larger silver artefacts. The spiral-twisted Permian silver neckrings of standardized weights belong here. These are very common in the Central Volga region (Arne 1914:217–18; Hårdh 2006:143). It is presumed that the area of production of the Permian rings both in silver and copper coincides with the old Finno-Ugric territories in what are now Russia and the Baltic states (Hårdh 1996:138; Gustin 2004c:292–3). Measured in grams, the Permian rings generally cluster around units of 100, 200 and 300 g. Most common are rings weighing around 200 g (Hårdh 2006:144, tab. 1, this vol. Ch. 5:108–13). It is conceivable that they were produced from North African dirhams, which dominate the Russian dirham finds from the beginning of the 9th century (see following section 7.4). The North African dirhams observed a lighter weight-standard than those struck in Iraq and Iran. On average they weigh c. 2.5–2.7 g.[21] A ring of about 100 g could thus be made with 40 North African dirhams, or four units of 10 coins (Kilger, this vol. Ch. 8.4). This may provide us with a further opportunity to interpret the absence of dirham finds from Eastern Europe in the earliest dirham period. It is possible, then, that there were extensive and regular contacts through which dirham silver – as remelted metal – fulfilled an important role within a field of exchange that need not necessarily find expression in the form of coin hoards.

7.4 The establishment of the dirham network in Eastern Europe (Phase II, t.p.q. 790–825)

In this section the dirham hoards from the end of the 8th century and the first quarter of the 9th are discussed, in order to reveal distinctive regional phenomena in the composition of the finds. This provides a subtler view of the distributional network for dirham silver in Eastern Europe at the beginning of the 9th century. The analysis also reveals a geographically bounded area of dirham circulation beyond Russia in the southern Baltic lands.

Phase II comprises finds with t.p.q.'s from c. AD 790 to 825. This phase represents the first importation of dirhams not only to Eastern Europe but also further west to the Baltic Sea zone (Noonan 1984a: 159–60). The Russian hoards are absolutely the predominant group of finds both in terms of the number of finds and in respect of their size (Tab. 7.5). This leading place is retained by the Russian hoards throughout the 9th and for much of the 10th centuries. It is striking that dirham hoards are found distributed over many areas of Russia, while those in the Baltic lands are found on Gotland but particularly along the southern Baltic shores. There is a clear concentration around the mouth of the Vistula (Bart-

	Number of finds	Dirhams	Largest dirham hoard	
Western Scandinavia	-	-	-	
East Central Europe	1	7	7	Răducăneni-Iaşi
Finland (mainland)	-	-	-	
Sweden (mainland)	1	5	5	Birka 1991 (small)
Southern Scandinavia	1	8	8	Østerhalne Enge[22]
Baltic islands	6	124	67	Hejde-Prästgården
Southern Baltic coast	12	369	124	Mokajmy Sójki
The Caucasus	9	1,623	610	Stisdzir
Eastern Europe	29	5,114	c. 1,700	Orsha?
Sum	59	7,250		
Western Europe	3	32	-	

Table 7.5 *The regional distribution of dirham hoards, phase II (t.p.q. 790–825).*

czak 1997; Brather 2006:134, fig. 1), and possibly also one around the mouth of the Oder (Fig. 7.9). A few finds, nearly all small, occur in mainland Sweden at Birka, in Jutland, and towards the south-east of Central Europe. Deposition in the Caucasus continued. There are also three coin hoards from inside the Carolingian Empire with a small number of dirhams (Ilisch 2005).

The North African signature

Dirham finds with t.p.q.'s from 790/800 to 825 form the first clear group of dirham hoards in Europe. A typical feature of the finds from Eastern Europe in this period is the Abbasid dirham struck in Iraq and North Africa post-769 (Noonan 1986:145–6). Distinguishing this as the period of the earliest importation of dirhams in to Europe was therefore proposed by the Russian numismatist Richard Fasmer (1933; Noonan 1984a:159; Fomin 1990:69). The composition of known and well-documented hoards from the beginning of the 9th century reveals clear differences between the Russian hoards and the finds from around the Baltic. A good indication of this is provided by a quantitative comparison of the distribution of Iraqi, Iranian, North African, Caucasian and Spanish coins (Tab. 7.6).[23] It is quite clear that the proportion of North African coins is quite different. This difference is most evident in the case of the Polish and East German hoards, in which the proportion is only about 3%, as opposed to over 50% in those from elsewhere in Eastern Europe. The few finds from Gotland stand in between with a figure of c. 15% (Fig. 7.9).

20 These include three finds with pressed silver-foil jewellery. These items were produced using 8th-century Umayyad dirhams as patrix dies. They are the female graves from Norrö Västergård, Östergötland (t.p.q. 730), 6 specimens, and Tuna i Badelunda, Uppland (t.p.q. 744) with 14 (Callmer 1977:nos. 131 and 161; Jansson 1985:156). There is also an uncertain find-group consisting of oval brooches, a trefoil brooch and beads from Reine, Komnes, Norway (t.p.q. 714), with 8 foils pressed on Umayyad dirhams (Callmer 1976:no. 24; Skaare 1976:no. 41). Umayyad coins are very well struck and have typical, easily recognized decoration in the form of annulets and rings. They also have a high relief, making them ideally suited for use as patrices (pers. comm. Gert Rispling). Consequently it is highly likely that Umayyad dirhams, which are very common in Scandinavian female graves, were deliberately selected for use as jewellery (e.g. Welin 1974, 1976; Thurborg 1988:308–9).

21 This is further confirmed by the coin glass weights we know from North Africa. Given on Egyptian glass weights is the figure of 13 *kharrūba* (Balog 1976:26). The Egyptian *kharrūba* or *qīrāt* weighed 0.195 g, which corresponds to a dirham weight of c. 2.53 g (Miles 1960:319–20).

22 It is uncertain whether Østerhalne Enge, Jutland, is to be counted as a dirham hoard. The coins were mounted with loops and found together with other artefacts (von Heijne 2004:358). There is no further information on the find. It may have been a grave-find. Other graves in Scandinavia with early dirhams are normally female graves dated to the 9th century (see nn. 19–20).

23 Tables 7.6 and 7.8, making use of information on the composition of Northern and Eastern European finds dated pre-850, are based partly on Thomas Noonan's unpublished find catalogue. The list of finds with information on the geographical composition was kindly made available by Gert Rispling. The composition of some Swedish finds has been checked and partially revised by Rispling. A new review will form the foundation of a project on the first phase of Abbasid minting (750–833) (pers. comm. Gert Rispling).

Figure 7.9 *Distribution map of dirham hoards, t.p.q. 790–825. Russian hoards with a high percentage of North African dirhams, reaching 50% (green shading); West Slav and Prussian hoards with a very low percentage of North African dirhams, around 3% (red shading); Gotlandic hoards with around 15% North African dirhams, probably deposited after c. 825 (dark blue shading); hoards containing North African dirhams in the Carolingian empire (yellow shading). Map, Julie K. Øhre Askjem, Elise Naumann.*

T.p.q.	Hoard	Dirhams	?	Spain	Africa	Iraq/Iran	Central Asia	The Caucasus	Khazar
	Sweden (mainland)								
810/11	Birka 1991 (small)	5	1	0	0	3	1	0	0
		100	20	0	0	60	20	0	0
	Gotland								
796/7	Hässelby	3	-	-	2	1	-	-	-
804/5	Hammars	8	1	0	3	4	0	0	0
816/7	Visby (vicinity of)	21	0	0	5	15	0	1	0
818/9	Norrgårda-Norrbys I	27	0	0	3	22	2	0	0
824/5	Prästgården Hejde	67	16	0	6	39	2	1	3
		126	17	0	19	81	4	2	3
		100	13.5	0	15.1	64.2	3.2	1.6	2.4
	Southern Baltic coast								
802/3	Prerow-Darss	72	28	0	5	38	0	1	0
811/2	Stegna	17	0	0	1	12	4	0	0
811/2	Zalewo	20	4	0	1	14	1	0	0
813/4	Krasnołąka	10	0	0	1	8	1	0	0
815/6	Bergen/Rugard	12	0	0	0	11	1	0	0
815/6	Braniewo	47	0	0	0	40	7	0	0
817/8	Mokajmy-Sójki	124	64	0	0	56	4	0	0
818/9	Neubrandenburg (vicinity of)	7	0	0	0	5	2	0	0
		309	96	0	8	184	20	1	0
		100	31.1	0	2.6	59.5	6.5	0.3	0
	East Central Europe								
805/6	Răducăneni-Iași	7	0	0	0	6	1	0	0
		100	0	0	0	85.7	14.3	0	0
	Eastern Europe								
803/4	Peterhof	83	0	0	72	10	1	0	0
805/6	Kholopii Gorodok	24	0	1	10	12	1	0	0
805/6	Krivianskaia stanitsa	82	0	0	49	30	0	3	0
809/10	Zavalishino	51	2	0	20	27	2	0	0
812/3	Nizhniaia Syrovatka	206	39	1	109	49	?	8	0
812/3	Ugodichi	148	0	22	62	53	7	4	0
820/1	Iarylovichi	285	1	4	142	125	7	6	0
820/1	Elmed	147	0	0	56	76	8	7	0
		1,026	42	28	520	382	26	28	0
		100	3.9	2.7	50.7	37.2	2.5	2.7	0
	sum total	1,473	156	28	547	656	52	31	3
		100	10.6	1.9	37.1	44.6	3.5	2.1	0.2

Table 7.6 *The regional composition of hoards, t.p.q. 800–25 (Rispling, in prep).*

The small proportion of North African coins and non-Abbasid dirhams in finds of the early 9th century in the Southern Baltic area has puzzled several scholars (e.g. Fomin 1990). In general, the North African dirhams should be represented in all areas that have early dirham finds, both inside the Caliphate and beyond (Noonan 1986:128–9). Inside the Caliphate there was no controlled circulation of coinage as there was in Carolingian Europe (e.g. Metcalf 1990); coins struck in different regions were accepted anywhere within the realm. As a result, the dirham hoards show a mixture of coins from various mints and various periods. But this mixing was not solely the result of trading links within the Caliphate.

It also depended upon the fact that the level of coin-production varied in intensity from period to period at the mints within the Caliphate. Over a longer period of time this led to the conflation of various regional coin-stocks (Brather 1997:108–10). Since the coins were valid throughout the Caliphate, the hoards ought to be of similar composition irrespective of where they are found. Why, then, are the hoards of Eastern Europe so different in composition from finds along the southern shore of the Baltic and on Gotland?

Figure 7.10 *The three coins from the earliest dirham hoard from Hässelby, Gotland (t.p.q 796/7) (CNS 1.3.3; SHM-KMK 8212). (left) Abbasid, al-Mansur, Madinat al-Salam, (1)54 =749/50, 1.55 g., (middle) Kharijite imam, Khalaf ibn al.Mada, Tudghah, 17(6)= 792/93, 2.54 g. (right) imitation, Idrisid eller Sulaymanid, "Tilimsan", 180–225 =796–839, 1.34 g. Scale 2:1. Photo: Gabriel Hildebrand, Museum of National Antiquities, Stockholm.*

The West Slav and Prussian dirham paradox

One possibility is that the hoards from the West Slav and Prussian area and those from Russia have different areas of origin. The differences between the two sets in size and composition may indicate that there were distinct distributional networks for dirhams at the beginning of the 9th century. It is conceivable that the concentration of dirham hoards along the Oder and around the mouth of the Vistula is the result of contacts between here and the interior of Central Europe and thereby to the areas that were in contact with the Black Sea area. However, as of yet, there is only one recorded dirham find from South-Eastern Europe with the same dating and composition that could bear witness to such a connexion (Teodor 1980).[24] More dirham hoards should have been found in Central Europe if this area was an important transit zone in the 9th century (Curta 2003). Although we cannot exclude the possibility of dirhams having been melted down to uncoined silver in Central Europe, dirham silver should still have left clearer traces in the archaeological evidence than we can yet see.

An alternative possibility is a source through, or along, the border areas of the Frankish Empire. A decisive argument against importation from Western Europe is that the few dirhams that are known from late 8th-century coin hoards in the Carolingian realm are all North African (Fig. 7.9). They were imported to Western Europe from the western part of North Africa after c. 790 (Ilisch 2005).[25] The small West Slav and Prussian dirham hoards ought in this case to consist overwhelmingly of North African coins, which is not the case.[26]

The third and most plausible explanation, which Noonan has already suggested, is founded on source-critical arguments. The finds from Poland and Eastern Germany should, in Noonan's view, have been of similar composition if they were contemporary with the Russian hoards. However their composition is in fact like that of hoards that occur only after c. AD 840 in Russia. It is then that the Abbasid dirhams again became dominant in the circulating silver (Noonan 1986:128–9). Further support for this analytical argument comes from the fact that the finds are small and that coining in the Caliphate declined drastically during the first quarter of the 9th century (below, 7.5).

The find-situation in respect of dirhams has changed markedly in Poland and Eastern Germany in recent years. Metal-detecting on the site of the large settlement at Janów Pomorski – probably the Viking-period Truso – on the Baltic coast of Poland has recorded 322 dirhams (Bogucki 2004:114). Like Kaupang, most of these were single finds of coins that had somehow been lost within the settlement area. The coins have not been published in detail, but preliminary information on their dating is available (Brather 2006:137–40). The latest dirham at Janów Pomorski dates to the 850s (Bartczak et al. 2004:46) , but most – of those dated so far – were struck in the 8th century or the first two decades of the 9th. It is noteworthy that other datable finds show that the settlement itself continued into the 10th century (Bogucki 2004:114).

24 The find from Răducăneni-Iași (t.p.q. 805/6), in what is now Romania, comprised seven dirhams of which three were perforated. The coins had not been fragmented and revealed no marks of cutting, i.e. nicks, which are very common in 9th-century hoards (see section 7.5). The absence of nicking suggests a later dating to the second half of the 9th century.

25 For example Ilanz (t.p.q. 793); Biebrich (t.p.q. 795); and Steckborn (t.p.q. 799/800) (McCormick 2001:817, 825 and 831).

26 Lutz Ilisch draws attention to the point that the North African dirhams differ stylistically from the other contemporary dirhams struck in the eastern provinces of the Caliphate. Their inscriptions are small and usually barely legible. This may have affected the identification of the coins, especially in early publications (pers. comm. Lutz Ilisch). Most 9th-century hoards in Poland were lost during the Second World War, so that their composition cannot be examined afresh (pers. comm. Mateusz Bogucki).

A comparable find-spot is Kap Arkona on Rügen, further to the west in what is now German Vorpommern. Archaeological work at the site has produced 17 single finds of dirhams (Ilisch 2000: 19–24). A point of interest is that it is possible to distinguish a chronologically earlier group of 14 Umayyad and Abbasid dirhams that are dated to between 719 and 826 and a later group of two Samanid dirhams struck between 892 and 922. The earlier group also includes a Sassanid drachma struck at the end of the 6th century. The fragments included a North African dirham that could only be identified on stylistic evidence (Ilisch 2000:n.27). A striking feature of the Arkona collection is the absence of coins dated between 826 and 892.

It is precisely the settlement finds, in my view, that are able to explain the early, non-North African find-layer in the West Slav/Prussian area. Arkona, and Janów Pomorski above all, show site continuity from the 9th to the 10th century. At both sites it seems that the same stock of coins circulated throughout the 9th century and was not supplemented with coins struck in the second half of the 9th century. Dirhams from this period are found in great quantities outside the West Slav and Prussian area and occur first and foremost in Russian and Swedish hoards with t.p.q.'s post-860 (Noonan 1985:44–6).

The dirham hoards from the southern Baltic lands thus do not provide any direct insight into their date of importation and period of use. The low proportion of North African coins in the hoards is therefore to be seen as a result of the dirhams having arrived relatively late, probably from Russia. An additional argument for later importation is that after c. 825 the West Slav/Prussian area is virtually void of finds (Fig. 7.16). There are just three large hoards from the period c. 825–860, which is phase III (below, 7.5). Coins in the many small hoards that date to phase II in terms of t.p.q. thus probably came into circulation to any substantial degree only after 825, and at the latest before 840 along the southern shores of the Baltic.

If this interpretation is correct, it gives us a clear example of later importation and a long period of circulation of dirham silver which cannot be seen in the dating of the hoards (see the methodological principles, above, 7.2). At Arkona, the dirhams were in circulation, according to their calendrical dates, for

some 50–70 years before they were supplemented with Samanid dirhams struck at the end of the 9th century. If that is so, it points to a regionally restricted circulation of coined silver. This left its mark in the form of single finds of dirhams in the focal settlements in the West Slav and Prussian territory, and in the form of dirham hoards outside of those sites.

The early Gotlandic find-group

The early Gotlandic hoards, which constitute the other dominant find-group in the Baltic area of phase II, contain a higher proportion of North African dirhams, at 15% (Fig. 7.9). The coin-range corresponds with neither the Polish-East German nor the Russian finds. The proportion of North African dirhams in the Gotlandic hoards remains practically the same after 825 at around 14% (Tab. 7.8). In contrast to the Gotlandic finds, the proportion of North African dirhams in the Russian finds falls from c. 50% to c. 6% in the period between c. 825 and 850. The composition implies that the importation of dirham silver to Gotland did not start in the early 9th century, as in Russia, but rather later. Were the situation different, there should be more and larger Gotlandic finds, and they should include a higher proportion of North African dirhams. It is therefore reasonable to conclude that many of the early Gotlandic finds bear witness to a better organized exchange of dirhams with the area of Russia at a later period. This process got underway at a date at which the proportion of North African coins in the Russian hoards was falling. To judge by the composition and size of the hoards, that happened no later than the end of the 820s. The same line of argument means that the Gotlandic hoards, because of the higher proportion of North African dirhams, are evidence of an earlier importation of dirham silver than to the West Slav and Prussian area. That began along the southern shores of the Baltic in a more organized way in the 830s and 840s.

There are exceptions, however. A few tiny Gotlandic hoards have a much higher proportion of North African dirhams – for instance Hässelby (t.p.q. 796/7) and Hammars (t.p.q. 804/5) (Tab. 7.6, Fig. 7.10). Characteristic of these finds is also the high proportion by weight of uncoined silver, both fragmented and unfragmented (Fig. 7.11).[27] Although we cannot exclude the possibility that these hoards were deposited later, their coins will very probably have

27 For example Hässelby (t.p.q. 796/7): weight of coins 5.43 g, weight of jewellery 363.21 g (Arrhenius, Welin and Tapper 1973:fig. 1; CNS:1.3.3); Hammars (t.p.q. 804/5), weight of coins c. 20 g, weight of jewellery 278 g (CNS:1.4.6; Stenberger 1947:69).

Figure 7.11 *Non-minted objects in the tiny dirham hoard from Hässelby, Dalhem Parish, Gotland (t.p.q. 796/7, Inv.no. 8212): fragments of spiral striated rings and ingots. Photo, Christer Åhlin, Museum of National Antiquities, Stockholm.*

arrived on Gotland before c. 825. Isolated hoards such as Hässelby and Hammars may therefore be the products of individual interchanges at a time when the exchange of dirhams with those parts of Eastern Europe that used such coins was beginning.

Conclusions

The comparative analysis of the composition and size of the dirham hoards, combined with their geographical distribution, shows that the use of these coins can be limited to an area in Eastern Europe and the Caucasus in the first quarter of the 9th century. Phase II has the first significant concentrations of finds outside of the Caucasus that can be taken as evidence that the handling of dirham silver had become established in various parts of Russia. Islamic coins had been integrated into the practices governing exchange relationships in this area. Abassid dirhams struck in North Africa are dominant in the material. This can be used as a basis for tracking this development within Russia.

The analysis of the composition of early dirham hoards from the Baltic Sea area apparently shows that the use of dirham silver had not spread beyond the area of Russia to any significant degree at the beginning of the 9th century. The large number of hoards along the southern shores of the Baltic lack the important North African signature. A comparison with single finds of dirhams from settlements in this same area rather indicates the later importation of dirham silver from Russia, probably not before the 830s or 840s, and possibly later still. The early t.p.q.-figures thus provide no direct indication on when dirham silver came into use in this area. A closer study of the composition of the Gotlandic finds shows that dirham silver reached the island in large quantities and a more regular manner only after c. 825. Dirham silver thus came into regular use later in the Baltic Sea zone than in Russia. A few Gotlandic hoards which have a significantly higher proportion of North African dirhams, however, are interpreted here as the products of occasional dealings early in the sequence of development.

The analysis of the hoards thus demonstrates that exchange relationships that made use of dirham silver developed over an extended period in the Baltic Sea zone. This presumably involved the same mechanisms, i.e. the conventionalization of the use of dirham silver, that I have described in relation to phase I between the Caucasus and Eastern Europe. The corollary of this is that coins were not distributed *en masse* over any wide geographical area. It was only when the use of dirham silver became a day-to-day practice, which means when coined silver became part of the everyday and constantly repeated routines of exchange, that dirham hoards begin to appear in larger quantities in the same region.

7.5 The establishment of the dirham network in the Baltic area (Phase III, t.p.q. 825–860)

The period from 830/840 to the 870s has been identified as a phase of consistent importation; which means a second wave, bringing large amounts of dirhams to Eastern Europe and the Baltic Sea zone, following the first wave of the beginning of the 9th century (Bartczak 1997:232–3). By way of introduction, I shall look at the monetary situation within the Caliphate during the second quarter of the 9th century. A number of scholars have drawn particular attention to a decline in minting after c. 810 that creates problems for the chronological assessment of dirham hoards. The question is, how that monetary situation affected the distribution and handling of dirham silver outside of the Caliphate. Another topic I shall discuss briefly is the testing of coined silver.

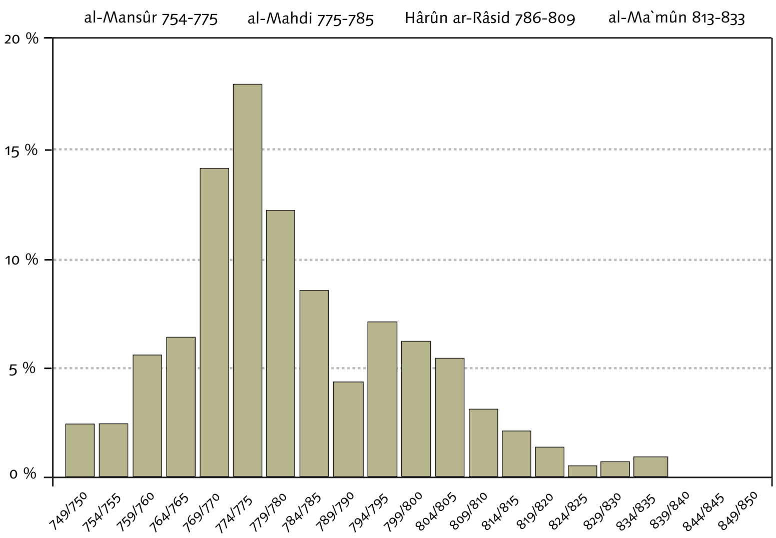
As we can see from Table 7.7, the period c. 825–860 stands out as the clearest phase of deposition of dirham silver in a number of regions around the

	Number of finds	Dirhams	Largest dirham hoard		Dinars
East Central Europe	-	-	-		-
Finland (mainland)	1	20	20	Housulanmäki	-
Southern Scandinavia	2	98	97	Sønder Kirkeby	9 Hoen
The Caucasus	6	772	394	Apeni	-
Sweden (mainland)	4	929	468	Wäsby	-
Baltic islands	10	2,169	894	Runne	-
Southern Baltic coast	4	2,709	2,211	Ralswiek	-
Eastern Europe	16	6,427	c. 1,500	Iagoshury	-
Sum	43	13,125			9
Western Europe	1	1	1	Westerklief I	-

Table 7.7 *The regional distribution of dirham hoards, phase III (t.p.q. 825–60), with the gold dinars from the Norwegian hoard of Hoen included.*

Baltic Sea, most of all on the island of Gotland. A number of hoards are also known from mainland Sweden and Finland, and on the islands of Åland and Falster. Particularly striking is the reduction of finds in the southern Baltic area, with just four hoards in contrast to the many dated c. 800–825 (see above, 7.4, and Tab. 7.5). These finds are scattered over a wide area from Rügen in the west and in Prussia and Lithuania. Eastern Europe is again dominant as the central area of deposition in phase III. The deposition of finds continues in the Caucasus. Most hoards have a latest coin date in the 830s (Fig. 7.7).

Figure 7.12 *The mint output under the early Abbasids (750–850) as reflected in hoards from the Middle East, the Caucasus, Russia and the Baltic area (after Brather 1997:fig. 3). Illustration, Elise Naumann.*



The reduction of minting in the Caliphate

Dirham hoards with t.p.q.'s within the first half of the 9th century are difficult to interpret. This is because the output of dirhams fell dramatically in the Caliphate as a result of the internal war amongst Caliph Harun al-Rashid's sons, and of religious conflicts between Sunni and Shi'ite muslims (Noonan 1986: 154–5; Rispling 2004a:29). The difficult interior political situation had an impact on the circulation of coins and silver both within and beyond the Caliphate. Noonan (1986) has produced figures for the level of minting at the most productive mint-sites of the Abbasids in the Caliphate between 750 and 850. His calculations are based upon a study of the finds from Scandinavia, Northern Europe, the Caucasus and the Caliphate that are dated pre-850. There is a clear reduction in minting in the reign of Caliph al-Mamun after 810 (Fig. 7.12). The few finds that can be dated post-810 probably do not reflect the collapse of contacts between Russia and the Caliphate but rather the low level of minting under Harun al-Rashid's successors. This means that hoards with t.p.q.'s in the first two decades of the 9th century could have been deposited later, from the 820s to the 840s, when coin production in the Caliphate fell to its lowest level. Finds with only a few dirhams in particular risk being assigned too early a date (Brather 1997:96–7).

One consequence of this monetary situation is that the dirham hoards of the first half of the 9th century contain a preponderance of earlier coins from the coin-rich period of the second half of the 8th century and the reign of Harun al-Rashid. In numismatic history, this has been identified as the first break in the 9th-century flow of dirhams to areas outside of the Caliphate (Noonan 1985:42). As was discussed in the previous section, this reduction in minting helps to explain the distinctive composition of the early dirham hoards along the southern shores of the Baltic (above, 7.4). In my view, though, it is possible to see more detail in this interruption. It was of shorter duration than is commonly assumed.

An interesting point is that Noonan's calculations do not include finds with t.p.q.'s post-850.[28] Hoards of that group have a much higher proportion of dirhams struck between 815 and 850. In these later hoards they constitute a rather higher proportion, 18–25%, while in hoards with t.p.q.'s pre-850 the fig-

28 For further methodological cricitisms of Noonan's approach, see Ilisch 2000:n.24.

29 The total number of coins from Stora Tollby II has most recently been revised to 155 specimens. Thus five coins have been counted twice in this table (pers. comm. Gert Rispling). Similarly the total figure for other Eastern European hoards has been changed, e.g. Kohtla to 481 ex. and Kislaia to 670 ex. (Rispling 2001:nos. 38 and 39). The percentages in the table, however, are not significantly affected.

T.p.q.	Hoard	Dirhams	?	Spain	Africa	Iraq/Iran	Central Asia	The Caucasus	Khazar
	Southern Scandinavia								
846/7	Sønder Kirkeby	97	65	0	5	26	1	0	0
		100	67	0	5.2	26.8	1	0	0
	Sweden (mainland)								
850/1	Kettilstorp-Storegården	30	11	0	0	16	3	0	0
		100	36.6	0	0	53.3	10	0	0
	Gotland								
833	Norrgårda-Norrbys II	62	12	0	11	32	6	1	0
834–42	Stora Tollby II	160	9	1	32	88	21	6	3
834/5	Sandgårde	12	5	0	2	5	0	0	0
835	Norrkvie I	30	5	0	1	19	4	0	1
840/1	Ocksarve I	439	40	3	57	278	43	6	12
842/3	Norrgårda-Jakobssons	59	0	2	9	43	3	1	1
		762	71	6	112	465	77	14	17
		100	9.3	0.8	14.7	61	10.1	1.8	2.2
	Åland								
837/8	Svedjelandet	107	0	4	12	79	4	4	4
		100	0	3.7	11.2	73.8	3.7	3.7	3.7
	Southern Baltic coast								
828/9	Ramsowo	336	8	0	10	278	33	7	0
841/2	Ralswiek	2,211	560	4	134	1,320	126	32	35
		2,547	568	4	144	1,598	159	39	35
		100	22.3	0.2	5.7	62.7	6.2	1.5	1.4
	Finland (mainland)								
837/8	Housulanmäki	20	2	0	2	11	3	0	2
		100	10	0	10	55	15	0	10
	Eastern Europe								
828/9	Uglich	1,114	912	1	17	148	11	25	0
831/2	Zagorod' e	15	2	0	0	12	1	0	0
835	Viatka	6	0	0	0	5	1	0	0
837/8	Kohtla	500	24	0	12	374	69	6	15
837/8	Kislaia	674	12	1	111	367	53	14	111
837/8	Devitsa	323	9	0	22	120	78	5	89
841/2	Dobrino	527	0	0	2	425	71	17	12
841/2	Vyzhigsha	1,278	0	5	149	951	125	22	26
841/2	Lesogurt	137	19	0	12	86	13	3	4
843/4	Iagoshury	c. 1,500	254	1	19	981	238	7	0
846/7	Staraia Ladoga	23	3	0	0	18	0	2	0
		6,092	1,235	8	344	3,487	660	101	257
		100	20.3	0.1	5.6	57.2	10.8	1.7	4.2
	Sum total	9,655	1,952	22	619	5,682	907	158	315
		100	20.2	0.2	6.4	58.9	9.4	1.6	3.3

Table 7.8 *The regional composition of dirham hoards, t.p.q. 825–50 (Rispling, in prep.).*[29]

ure is only 4% (Noonan 1986:138–40). How is this difference to be explained? A reasonable answer is that what we can see here is evidence of a new influx of dirham silver some time in the second half of the 9th century. This new supply included, proportionately, a higher quantity of dirhams from the period of low mint-output following 810. The proportion is sufficiently high that it is clearly perceptible when compared with the dirham silver that was already in circulation. This may show that the quantity of coined silver that was carried to Scandinavia grew markedly in the second half of the 9th century. I shall discuss this conspicuous change in silver importation in more detail in the next section, which concerns finds with t.p.q.'s from 860 to 890 (below, 7.6).

There is, meanwhile, one more important reason why coins struck between 820 and 850 are sparsely represented in the finds. These dirhams are of a much poorer standard (Noonan 1990:254). For this reason they are difficult to identify, which can exaggerate the impression of a reduction in minting. This is clear when we take an overview of the composition of the hoards with t.p.q.'s from c. 825–850 in the following table (Tab. 7.8). More than 20% of the dirhams are unidentifiable. Altogether, we can confidently say that the monetary reduction immediately after the reign of Caliph Harun al-Rashid is a matter of fact, but that it was probably of shorter duration than has generally come to be believed.

The Khazar imitations

As the discussion shows, the dating of hoards deposited during the first half of the 9th century is affected by the low output of coin from the Caliphate. Another fundamental problem is the low standard of minting in this period, which makes identification difficult. This makes it difficult, in turn, to determine numismatically when the dirhams reached a particular area of Northern or Eastern Europe and for how long they remained in circulation – i.e. were used in that area. One consequence of this is that even if there was an exchange of dirham silver between the Caliphate and the unmonetized areas outside in the period of low output, there is little chance of observing it in coin-finds themselves. But the requirements for following contacts and exchange between regions in Eastern Europe and Scandinavia have, however, been changed by the numismatic description of the Khazar imitations (Rispling 2005a). The identification of the existence of Khazar dirhams has fundamentally transformed the bases on which dirham hoards of the second quarter of the 9th century are assessed. The separate coin-production of the Khazars outside of the Caliphate coincided with the period of low output in the second quarter of the 9th century.

It has long been disputed whether or not the Khazars minted for themselves (e.g. Arne 1914; von Zambauer 1968). The Khazar question was re-activated in numismatic scholarship by the Russian numismatist Alexei Bykov's analysis of the coin-find from Devitsa in the Northern Caucasus. Bykov (1971) classified the Abbasid imitations in this find as Khazar copies. Gert Rispling (1987:83, 2001:327, 2005a) has used die-studies to connect a series of Abbasid imitations to the known Khazar coins and thus supported Bykov's argument with empirical evidence (Fig. 7.13). The earliest date given on a numismatically identifiable Khazar dirham is 837–8. In a number of hoards these imitations now provide the latest coin (Talvio 2002:42–3). The number of known Khazar imitations is, however, still limited. They occur especially in the larger dirham hoards (Tab. 7.8). But it is possible to trace the development of contacts and exchange even in the period of low output. They occur in large quantities in a number of Eastern European finds of the 830s in particular (Fig. 7.14). These probably reflect direct contacts with their Khazar area of origin. This means that the first dem-

Figure 7.13 *Khazar dirham with the inscription Moses, an imitation of a dirham issued in Madinat al-Salam 766–7: Spillings IV, Gotland (t.p.q. 870/1), 2.08 g. Scale 3:1. Photo, Gabriel Hildebrand, Museum of National Antiquities, Stockholm.*

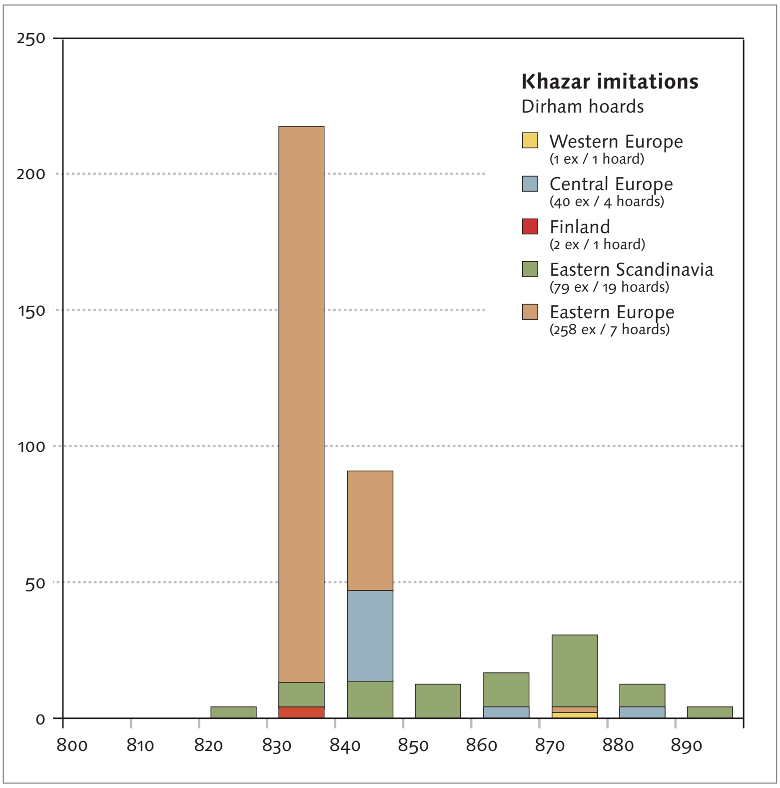


Figure 7.14 *Dirham hoards of the 9th century with the quantity of Khazar imitations recorded. Histogram based on the numbers of the earliest Khazar imitations (ImKz_1) in Rispling's (2001) list of finds.*

onstrable occurrence of Khazar imitations is qualitatively and quantitatively a consistent phenomenon in dirham hoards over wide geographical and cultural areas.

Structural changes in the dirham hoards

Yet another feature that distinguishes phase III from phase II is the striking reduction in the proportion of North African dirhams in the Russian hoards (Tab. 7.8). The North African coins are increasingly replaced by dirhams from a series of other regions, such as the Southern Caucasus, Transoxania, and Northern Iran (Noonan 1984a:160).[30] Particularly prominent in finds of the 830s are dirhams struck in the Tahirid controlled provinces of Eastern Iran and Central Asia (Noonan 1981:70–1), alongside the Khazar imitations. Phase III can also be described on the basis of changes in the regional distribution of dirham silver and qualitative changes in the composition of the finds. During the 830s and 840s the first large hoards containing up to several hundred dirhams appear in the Baltic area (Tab. 7.8–9): occasionally, as in the find from Ralswiek on the island of

30 According to Noonan's calculations (1986:151–2), two of the most prolific and important North African mints, al-Abbasiyya and Ifriqiya, stopped producing dirhams at the beginning of the 9th century.

Find	Region	T.p.q.	Coins	Spiral striated neckrings	D-shaped ingots
Hässelby	Gotland	796/7	3	X	X
Hammars	Gotland	804/5	8	-	X
Ramsowo	Southern Baltic coast	828/9	336	-	-
Wäsby	Mainland Sweden	832/3	468	-	-
Norrgårda-Norrbys II	Gotland	833	62	X	-
Stora Tollby II	Gotland	833–842	155	-	X
Kohtla	Estonia	837/8	481	-	-
Svedjelandet	Åland	837/8	114	-	-
Ocksarve	Gotland	840/1	437	-	-
Ralswiek	Southern Baltic coast	841/2	2,211	X	-
Norrgårda-Jakobssons	Gotland	842/3	59	X	-
Sønder Kirkeby	Falster	846/7	97	X	-

Table 7.9 *Dirham hoards from the Baltic Sea region, some containing armrings of the Permian and Duesminde types, and D-shaped ingots.*

Figure 7.15 *Basket containing hoard from Ralswiek, Rügen (t.p.q. 841/2). The hoard was found during controlled excavations, in a basket in a burnt house. Photo, Landesamt für Kultur- und Denkmalpflege, Schwerin.*

Figure 7.16 *Distribution map of dirham hoards, t.p.q. 825–860. Map, Julie K. Øhre Askjem, Elise Naumann.*

Rügen, up to several thousand (Fig. 7.15, c.f. Herrmann 1997:88, fig. 57). The Baltic islands, with Gotland in the lead, stand out with a number of finds rich in dirhams. In phase III we also have the first consistent coin dated evidence for the occurrence of spiral-twisted silver rings and D-shaped ingots (Tab. 7.9). The spiral-twisted rings of the Permian type are apparently of Oriental origin (Hårdh 1996:138, see also Hårdh, this vol. Ch. 5:108–13; Gustin 2004c: 292–3). D-shaped ingots and fragments of spiral-twisted neckrings are, however, also found as early as in the first Gotlandic dirham hoards in phase II, in the first quarter of the 9th century (Fig. 7.11).

There are several details that represent changes in the distribution of dirham silver in the second quarter of the 9th century: the size of the hoards, their composition, and the regional distribution of the finds. The large hoards of this period show that large quantities of dirham silver were reaching the Baltic Sea zone in a more organized way. In phase III, the Baltic area as a whole, but also the individual regions in mainland Sweden, especially Central Sweden, became a common area of circulation of dirham silver, stretching from the Baltic Sea zone to Eastern Europe (Fig. 7.16). To judge by the t.p.q.'s of the hoards, the larger dirham hoards begin to appear in Scandinavia – other than on Gotland – only after c. 830 (Wäsby, Uppland: t.p.q. 832/3).[31] More consistent tendencies in the clustering of finds can first be detected in regions of Sweden such as Uppland in the 850s (Helgö: t.p.q. 856/7), Gästrikeland (Häcklinge: t.p.q. 857/8) and Västergötland (Kettilstorp: t.p.q. 850). We can also include here one of the few 9th-century Danish dirham hoards, namely Sønder Kirkeby on the island of Falster (t.p.q. 846/7).

Taking a broad Baltic perspective, the growing number of Scandinavian hoards can also be linked to the West Slav and Prussian finds (Ralswiek: t.p.q. 841/2; Wieschendorf: t.p.q. 850/5; Ramsowo: t.p.q. 828/9). As I have already suggested, many of the phase II small hoards found along the southern shores of the Baltic, should also be assigned to a later phase of dirham importation than the latest coin date would seem to indicate (above, 7.4, Fig. 7.9). If this inference is right, the use of dirham silver in the coastal West Slav and Prussian areas was much more extensive than the distribution map for phase III (Fig. 7.16) reveals. The large numbers of small finds also suggest that the use of dirham silver – in whatever form – broke through widely amongst a large group of people. Neither Gotland nor the remainder of Scandinavia have any comparable concentration of small dirham hoards.

The re-use of dirham silver

Typical of dirhams in Northern European finds is that they have small nicks in the edge of the coin

31 The dispersed hoard of Wäsby in Uppland has been given a late date, in the 860s, in some publications (Gustin 2004b; Zachrisson 1998:285). The find spot of this hoard has been reinvestigated using metal-detectors. The results of this investigation have not yet been published, but the later date suggested by Gustin and Zachrisson has not been confirmed by the sample of coins newly found. The high proportion of nicked coins in this sample (18 out of 22 specimens), some 82%, also argues for an earlier date, in the first half of the 9th century.

32 This has been checked for hoards that have been published in the CNS-series (CNS): Hässelby (t.p.q.796/7); Hammars (t.p.q. 804/5); Norrgårda-Norrbys I (t.p.q. 818/9), Norrgårda-Norrbys II (t.p.q. 833/4), Norrgårda-Jakobsson (t.p.q. 842/3).

33 For instance Östris (t.p.q. 869/70) 36% – 109 out of 300 identified specimens in parcel C; Bölske (t.p.q. 876/7) 36% – 41 out of 113 specimen in parcel A (notched coins [nh] not included in the figures).

34 The two dirhams that form the lump of melted coin are excluded here.

metal (e.g. Figs. 7.10, 7.14; Rispling 2004b). Ulla Linder Welin (1956a:152) understood the nicks as primarily a Scandinavian phenomenon. More recent research has suggested that they arise in Russia, and more precisely in the Caucasus (Rispling 1998). A study of Swedish hoards dated to the first half of the 9th century reveals that nearly all of the coins have been nicked.[32] It is only in hoards dated post-870 that the proportion of nicked coins reduces significantly.[33] Gert Rispling (2004b:33) has also noted a detectable reduction of frequency from 850.

That the proportion of coins with nicks in hoards falls significantly during the second half of the 9th century may be due to the coins having come from different areas of circulation within the Caliphate. Another possible explanation is rather that the finds show changes in the testing practices in this period. Dirham silver was eventually accepted without need for further testing (pers. comm., Gert Rispling). The presence or absence of nicks can also be used to date single finds of dirhams in settlement layers as at Kaupang. Examination of the Kaupang finds shows that nicks are not widely found. Of 90 coins recorded, 16 had signs of nicking: some 15%.[34] Thus the Kaupang dirhams belong in all probability to a phase of dirham importation that started off only in the second half of the 9th century (see also Blackburn, this vol. Ch.3.5.3).

Conclusions

The reduction of coin-output in the Caliphate has been identified as a crucial methodological issue affecting the interpretation of finds from this period. The finds thus offer few secure bases for tracing the development of those contacts that were rooted fundamentally in the exchange of dirham silver. But the conditions for studies of dirham finds from the second quarter of the 9th century have been changed in a key way. This is primarily a result of the identification of the so-called Khazar imitations as a separate group of dirhams. It is of interest that the manifest increase in finds in the area of Northern and Eastern Europe in the 830s (Fig. 7.7, Tab. 7.3) can be associated with the concentration of Khazar imitations in a number of hoards. This may reflect both a change in and the intensification of contacts with the East.[35]

The analysis of secondary elements on the dirhams such as nicks offers another way of checking the dating of dirham finds and of identifying an early dirham phase in those regions in Scandinavia which were the leading area for the circulation of silver in the first half of the 9th century. The small proportion of nicked coins indicates that the dirhams from Kaupang probably belong to a pool of silver that only came later into circulation in Scandinavia, in the second half of the century.

The hoards of the second quarter of the 9th century indicate the circulation of significant amounts of dirham silver outside of Eastern Europe. From phase III there are large dirham hoards in several areas around the Baltic (Fig. 7.16). Alongside these, we must set the small dirham hoards of the West Slav and Prussian area which according to t.p.q. are to be dated pre-825 but which can more realistically be regarded as the products of an inflow of dirham silver from Eastern Europe that got under way only in the 830s and 840s (above, 7.4). This indicates that the exchange relationships in which Russian dirham silver was a fundamental element gained an increasingly secure hold in the Baltic Sea zone in phase III, especially on Gotland and along the southern shores of the Baltic. The many small finds also show that the use of dirham silver was reaching a wider circle of the population in the West Slav/Prussian coastal zone.

On the other hand, there is no sign of the use of dirham silver reaching a more organized and regular level in Southern Scandinavian during the first half of the 9th century. There are no dirham hoards like those of the Baltic Sea zone except that from Sønder Kirkeby (t.p.q. 846) on Falster. Sønder Kirkeby is thus the westernmost dirham hoard of phase III. The scattered hoards in mainland Sweden and in the area of Denmark thus follow the same pattern as we have formerly seen in Russia and on Gotland. They can be interpreted as individual activities in an early, preliminary stage in the use of dirham silver.

Figure 7.17 *Distribution map of dirham hoards, t.p.q. 860–890. Map, Julie K. Øhre Askjem, Elise Naumann.*

The stratigraphically based excavations at Kaupang provide us with a unique opportunity to compare and understand regional differences in the way silver was used. A review of the 9th-century dirham hoards shows at present that Southern Scandinavia formed a distinct region which did not follow the same course of development as the Baltic area. The impression of Southern Scandinavia as an almost dirham-free area is reinforced by the stratigraphical evidence from Kaupang. The surviving layers dated between 800 and c. 840/50 were methodically sieved (Pilø 2007b: 156–8). Rather than dirhams there are some pieces of uncoined hacksilver in later stratified contexts of site period II, which means the second quarter of the 9th century (Pedersen and Pilø 2007:187–8, tab. 9.2). Apart from just one Carolingian denier (Blackburn, this vol. Ch. 3:56, 58), the stratified deposits of Kaupang thus indicate that during the first half of the 9th century silver was used primarily in uncoined form. But when, then, did coined silver such as dirhams start to circulate in greater quantities in Kaupang and Southern Scandinavia?

7.6 The Abbasid find-horizon after AD 860 (Phase IVa, t.p.q. 860–890)

The second half of the 9th century has been characterized by some scholars as a period of recession in trading networks, leading to a change in the prevailing economic system in Scandinavia and the Baltic Sea zone (e.g. Randsborg 1980; Callmer 1994:66–8). It has also been suggested that there was a break in contacts with Eastern and Western Europe, and an all-round shortage of silver both in Scandinavia and in Eastern Europe during this period. The silver-crisis hypothesis has been built upon a variety of observations concerning the coin-finds linked together with information from historical sources. The already sparse inflow of Frankish deniers and Anglo-Saxon pennies to Scandinavia came to an end as a result of,

35 According to Talvio the increase in hoarding in the 830s indicates a shortage of silver in the Baltic region. This lack of silver was probably a product of the monetary crisis in the caliphate (Talvio 2002:90).

inter alia, Viking raiding and the growing economic and political insecurity in the West. In this period the first phase of the early Southern Scandinavian coinage also came to an end (Malmer 1966:213–6). A similar pattern of unrest and turmoil seems also to affect the Eastern networks after c. 860 (Callmer 2000b: 74–6). The trade-routes in Russia were plagued with troubles as well. As a direct consequence, it is thought, dirham silver went out of circulation in this period too, leading to a comprehensive silver drought in Russia and the Baltic Sea zone (Noonan 1985:42–8). In this section, however, I propose that dirham finds from this period may show quite the opposite: namely the existence of the widespread circulation of dirham silver and even an increase in access to silver both in Eastern Europe and around the Baltic. Furthermore, the use of smaller but considerable amounts of dirham silver can be seen for the first time in the monetized areas of North-Western Europe.

Phase IVa concerns hoards with t.p.q.'s from 860 to 890 (Fig. 7.17). In the year 892 the Samanid emirs began their large-scale minting in Central Asia (Noonan 2001:153). The later boundary is defined in terms of numismatic history and has no direct reflection in the hoards – not in Scandinavia, at least. The role of phase IVa is to distinguish between hoards of Abbasid dirhams and mixed hoards of both Abbasid and Samanid coins. The mixed hoards will be discussed as phase IVb in the next section (below, 7.7). From phase IVa a total of 68 hoards (excluding Western Europe) with around 45,000 dirhams has been recorded (Tab. 7.10). The Eastern European finds dominate the picture, followed by the Baltic

	number of finds	dirhams	largest dirham hoard	
Finland (mainland)	-	-	-	
Western Scandinavia	1	7	7	Torgård
Southern Scandinavia	2	17	13	Rantrum
Southern Baltic coast	2	394	251	Pinnow
The Caucasus	2	c. 808	c. 670	Chikaani
East-Central Europe	2	1,074	766	Czechów
Sweden (mainland)	6	2,711	2,049	Äskedal
Baltic islands	23	20,500	c. 9,100	Spillings IV
Eastern Europe	30	19,471	> 10,000	Vitebsk
Sum	68	44,982		
Western Europe	3	99	95	Westerklief II

Table 7.10 *The regional distribution of dirham hoards, phase IVa (t.p.q. 860–90).*

Figure 7.18 *Hoard from Spillings II, Gotland (t.p.q. 874–875). Photo, Raymond Hejdström, The County Museum of Gotland.*

islands, particularly Gotland. The Swedish mainland also has a higher number of dirham hoards than from previous phases. There are isolated dirham finds in both Southern and Western Scandinavia, the Frankish empire, Frisia and England.

The frequency of deposition shows a distinct increase in the 860s, with 40 finds, and an equally marked decrease post-c. 875 (Tab. 7.3, Fig. 7.7). The high number of coins of phase IVa is also a product of two exceptionally large finds from Spillings, Gotland, with a total of 14,200 dirhams (Fig. 7.18). It should likewise be stressed that the high quantity of coins in Eastern Europe is primarily the product of a now dispersed hoard from Vitebsk in Belorus. The number of coins has been calculated here on the basis of information on the total weight of coined silver.

The concept of a great silver crisis

A number of scholars have discussed whether or not there was a general "silver crisis" that affected the exchange network in Scandinavia in the second half of the 9th century (e.g. Malmer 1966:212–18; Randsborg 1980:152–3; Noonan 1985). A key factor behind this hypothesis has been the interpretation of the coins from the graves at Birka. The large number of coin-bearing graves there shows a clear fall in the number of dirhams struck betweeen c. 850 and 890 (Arbman 1955:135).[36] The lack of coins dated calendrically to the second half of the 9th century has been interpreted both by Brita Malmer and Klaus Randsborg as evidence of the general absence of coins and consequently of a shortage of silver. This argument depends upon a very precise reading of the year in which coins were minted. Methodologically, it presumes a close connexion in time between minting in the Caliphate, the importation of coins to Scandinavia, and the dates at which these came into use at Birka. As I explained by way of introduction, this is a problematic supposition (above, 7.2).

The theory of an all-round shortage of silver in the second half of the 9th century has had several far-reaching consequences in studies concerned with the importance of silver in Viking society. Both Malmer and Randsborg used the silver crisis as a decisive argument against Sture Bolin's concept (1953) of Scandinavian-controlled transit trade between the Caliphate and the Carolingian realm in the second half of the 9th century. Rather than a surplus of silver that Scandinavians carried westwards, this half-century is characterized in their view by the collapse of the network of exchange. It is precisely the lack of calendrically dated individual finds of coins that is for both of these a key argument against Bolin's idea of an economic and political upswing in the wake of Scandinavian expansion. Scandinavia thus was not functioning as a transit area in the second half of the 9th century (Malmer 1966:216–17; Randsborg 1980:158–9). The silver-crisis hypothesis has also contributed less directly to dating the beginning of large-scale silver jewellery production in Scandinavia to c. 900 onwards. The necessary conditions for this output, in Southern Scandinavia at least, were not to be found until large quantities of dirham silver were in

36 Kenneth Jonsson (2001:33) has recently referred to 133 coin graves at Birka with a total of 227 specimens, both Western and Eastern. Landgren's database provides information on 158 dirhams in 111 graves. In place of the only four examples originally noted by Holger Arbman (1955:135) there are 9 dirhams struck between 850 and 883 from 7 graves: Birka grave nos. 307 (855); 513 (862); 709 (854); 737B (883); 840 (850); 1045 (c. 864); and 1057 (800; 869; 869; 880). Three graves with coins of this date also contained coins issued after 890: 524 (860; 864; 909); 707 (726; 860; 899); and 968 (860; 905; 906).

circulation, which coincided with the beginning of the importation of Samanid coins at the start of the 10th century and a rise in the number of coin dated hoards (e.g. Hårdh 1996:65; above, 7.1). By contrast, the marked increase in dirham hoards in the 860s has – with some exceptions (e.g. Herschend 1989:390; Callmer 2000b:75) – not been noted or discussed in the literature. In the next section, therefore, we need to look more closely at this peculiar peak in frequency of deposition and to discuss what it may represent.

Silver crisis or silver glut?

Like Malmer and Randsborg, even Thomas Noonan (1985) sees evidence of a general "silver crisis" in the coin finds. In order to sustain this idea Noonan anlayses the age structure of dirham hoards from this period. The composition of Russian, Polish and Swedish hoards from the second half of the 9th century provides evidence for changes in the importation of coins in the East between c. 850 and 875. Hoards with t.p.q.'s post-850, but especially post-860, contain higher and higher proportions of newly minted dirhams (Noonan 1985:44–5, charts II–IV). In finds with t.p.q.'s post-875 this growing tendency reverses. Characteristic of these finds is that they contain few recently minted coins (Noonan 1985:45–8, charts V–VII). In contrast to the situation in the first half of the 9th century, the reducing frequency of recent coins post-875 was not the result of any monetary and political crisis in the Caliphate (above 7.5). Comparative studies of coin hoards in the Middle East reveal continuity of production (Noonan 1985: 47–8, chart IX). The aging and diminishing stratum of finds post-875 points, in the view of Noonan, to a break in the established distributional network for dirham silver beyond the Caliphate. In his view, however, this silver shortage affected both Russia and the Baltic Sea zone only for a relatively short period. The Eastern silver crisis eased at the beginning of the 10th century when the exchange of dirham silver and the contacts between the Caliphate and Eastern Europe changed in character. It was then that newly coined Samanid silver from Central Asia swiftly becomes evident in our finds (Noonan 1985:48–9).

There is an important methodological consideration concerning the evaluation of the frequency of deposition that needs to be considered here but which was not discussed by Noonan. The increase in the deposition of finds need not immediately depend upon a greater deposition of dirhams in the 860s and 870s only. What we can be sure of is that the increase in finds was the result of intensive importation and deposition that cannot have begun until after 860. Known hoards with Samanid dirhams from the beginning of the 10th century represent a secure lower limit for phase IVa (7.7). The same reasoning applies to the reduction of finds post-875. This is not necessarily evidence that there was an end to hoarding after 875, or that this is a reflection of a general shortage of silver. It is consequently far from certain that the short silver boom that Noonan has described lasted only some 15–20 years. It could perfectly well have lasted much longer.

In my view, the drastic increase and decrease in finds should be explained another way. It was conceivably a consequence of a disruption of contacts in one or more of the intermediary links to the monetized areas of the Caliphate. Since no – or just a few – dirhams struck post-875 are found in these intermediary locations, the datings cluster, and imply an increase in the frequency of deposition. In this case, the most recently struck coins that were circulating in Eastern and Northern Europe affect the dating of the finds even if they were old when they came to be buried. One consequence is that the impression given by finds assessed in terms of t.p.q. becomes intense in what appears to be a long stretch of the histogram. But coins could have remained extensively in circulation after 875 too. Here we face a general methodological constraint on using the t.p.q.-histogram to identify either a shortage or the availability of silver coin.

But there is every reason to believe that Islamic silver coin minted after c. 875 was still reaching some areas of Eastern Europe and from there was transported further to the West. There are seven hoards on Gotland (Dals: t.p.q. 880/1; Slite: t.p.q. 881/2; Kinner: t.p.q. 883/4; Sojvide: t.p.q. 885/6; Hägvide t.p.q. 887/8; Larsarve: t.p.q. 890/1; Lingsarve: t.p.q. 896/7), two hoards from the interior of Poland (Czechów: t.p.q. 882/3; Drohiczyn: t.p.q 893/4) and two hoards from the Ukraine (Poltava: t.p.q. 882/3; Novaia Lazarevka: t.p.q 893) that are dated to the 880s and 890s (Fig. 7.21). This may show that dirham silver minted in the Caliphate was transported to the island and to some other parts of Eastern Central Europe during the period of sparse finds. There were probably still some distributional networks operating in Eastern Europe obtaining silver directly from the Caliphate which were not affected even by the post-875 cessation (see Tab. 7.3). We shall look at Gotland further in this light in the final section.

The theory of a silver crisis is partially correct insofar as it works to explain the reduction in the *supply* of dirhams struck post-875: i.e. there was a break in contacts between the Caliphate and some networks through which dirhams were distributed in the East. But the theory is utterly misleading as an account of the access to silver and the *actual quantity* of dirham silver that remained in circulation in Scandinavia after 875. The massive rise in dirham hoards dated post-860 represents a clear increase in the quantity of dirhams which preceded the importation of Samanid coins of the beginning of the 10th century. It can therefore be regarded as a major surge in the importation of silver in its own right. The pre-Sama-

Find	Region	T.p.q. Islamic	T.p.q. European	Total coins	Islamic coins	European coins	Silver objects
Croydon	England	842/3	872	c. 250	3	AS, C	X
Torksey	England	(866/8)	(x-875)	172	68	AS	X
Busdorf I/Hedeby	Schleswig-Holstein	867	c. 825	7	4	S	-
Muizen	Belgium	867	?	73	1	C	-
Westerklieff II	Northern Frisia	871/2	875/7	134	95	C	X
Rantrum	Schleswig-Holstein	873–7	-	13	13	-	X
Cuerdale[37]	England	895/6	905	c. 7,000	36	AS, C, S	X

Table 7.11 *Hoards containing dirhams in Southern Scandinavia and North-Western Europe, with t.p.q.'s post-860. Including single finds from the "productive site" of Torksey: AS = Anglo-Saxon; C = Carolingian; S = Scandinavian.*

nid wave of imports still included many older dirhams struck in the 8th century and early in the 9th, alongside, however, a higher proportion of later 9th-century coins. The difficulty is, to determine when dirhams from this influx made an impact on the exchange relationships in unmonetized regions of Scandinavia. To try to answer this question, we need to turn our attention further west, to the monetized areas of the Frankish realm and to Anglo-Saxon England.

Dirham finds from the North-West of Europe

The use of metal-detectors has transformed the situation in respect of dirham finds in North-Western Europe too. This is the case above all in Great Britain (Blackburn 2003) and the West Frisian coastal territories of the Netherlands (Besteman 2004a:93 and 102, fig. 3). A number of finds can be associated with the presence of Scandinavians in the neighbourhood and with historically attested Viking expeditions in Western Europe of the second half of the 9th century. The Western European coins found either in, or immediately adjacent to, the areas in which they were originally valid. The Anglo-Saxon pennies and Carolingian deniers, which as a rule had a shorter period of currency and use than dirhams, thus provide a control on the dating of the dirhams that are included in find-complexes (Tab. 7.11).

At the farm of Westerklief on the island of Wieringen in the Netherlands, two hoards of Viking-period character were discovered in various stages between 1995 and 2001. These finds provide the first direct numismatic evidence of Scandinavian influence in this area. They also corroborate the information in the historical sources indicating that West Frisia was under the control of Danish Vikings in the second half of the 9th century (Besteman 2004a: 94–5). The earlier hoard, Westerklief I, which is dated to 850, contained 78 whole Carolingian deniers. With these was found one dirham and two Sassanid drachms. These had been reworked as coin-jewellery (Besteman 1999). The find also contained various types of complete armring and ingot. The hoard weighed c. 1.6 kg in total. The later find, Westerklief II, contained 95 dirhams, of which 54 were in fragments, 39 Carolingian deniers, 24 fragments of hack-silver, and a complete ingot (Fig. 7.19). This hoard weighed much less than the earlier one, c. 450 g. The latest coin date for the later find is determined by a large number of Islamic and Carolingian coins that lie very close in date. The t.p.q. of the dirhams is 871/2 and that of the Carolingian deniers 875–7 (Besteman 2004a:95–8; Coupland 2006:249).

Torksey, in Lincolnshire, in the North-East Midlands of England, is a further find-place from which metal-detecting has produced a large number of individual finds of coins (Blackburn 2002). Documentary sources give Torksey as a campsite of the Viking Great Army that invaded England in 865. This army camped at Torksey for an extended period in 872 and stayed there over winter (Blackburn 2002: 89). Altogether at least 50 coins have been recorded from three fields outside Torksey, including 11 dirhams.[38] Recently there have been recorded many more dirhams which makes now a total of 68 known specimens (Blackburn, this vol. Ch. 3:49–50). As of yet, this is the largest number of dirhams known from any of the "productive sites" of Great Britain (Graham-Campbell 2004:41). The coins have been found over a relatively wide area and thus cannot be the remains of a plough-scattered hoard. The historical dating of the Torksey camp to the year 872 matches the dates of the coins from the site well. So far, five English pennies have been recorded that were minted and current in the period 862–873. No later 9th-century, or 10th-century, coins have been found here. Earlier 8th-century pennies and sceattas may be evidence of earlier activity at this place. Finds of Anglo-Scandinavian metalwork, meanwhile, seem to indicate that this site continued to function in some way

37 McCormick 2001:821; Rispling 2001:no. 109.

38 Graham-Campbell refers to 13 specimens (2004:41).

or other during the 10th century (Blackburn 2002: 90–3 and 99). It is of interest that the dirhams in the small dirham hoard from Croydon, south of London, all date to the first half of the 9th century. Westerklief II, by contrast, shows Islamic and Western European coins with latest dates that are contemporary, dated to post-871/2 and 875/7 respectively. A close chronological correlation in the range of the dates of issue of Western Europe pennies and the dirhams is also evident from the single coin finds from Torksey (Tab. 7.11).

Croydon provides only a limited statistical basis in respect of the number of dirhams in the assemblages. But the chronological discrepancy in its t.p.q.'s may show that relatively old dirhams, struck before c. 850, remained in circulation down to c. 870 at the latest. Fragments of coins were in the possession of Danish Vikings who were members of the Great Army and had presumably obtained those dirhams in the lands around the Baltic Sea area. The only larger dirham hoard from the territory of Denmark of the 9th century is that from Sønder Kirkeby on Falster (t.p.q. 846/7), with 97 dirhams. In the same area, although in the South-East of Sjælland, is the detector-find site of Strøby, which has early dirhams. This find-assemblage consists of thirteen coins which may derive from a ploughed-out hoard. Strøby is dated to c. 850 (von Heijne 2004: 298). At Torksey, Croydon, Sønder Kirkeby and Strøby, fragments of the Scandinavian imitations of spiral-twisted armrings of Eastern type were also found. All of the early dirham find-spots in Denmark and all of the early Western dirham hoards are thus inter-related in a further archaeological way (Munksgaard 1963; Graham-Campbell 2004:40–1; see Hårdh, this vol. Ch. 5:96, 111).

Not only Croydon but also Sønder Kirkeby and Strøby seem to indicate a general tendency in the circulation of dirham silver. All of the coin-finds indicate that down to the 860s relatively old dirhams were in circulation. Westerklief II and Torksey, with more recent dirhams, thus appear to indicate that "newer" dirhams began to circulate in the North Sea area at the latest at the beginning of the 870s. The changes in the composition of the westernmost dirham hoards should thus also be applicable to the chronological evaluation of all of the dirham finds from Northern and Eastern Europe.

Conclusions

Both the individually found coins and the dirham hoards have been cited as evidence of a shortage of silver during the second half of the 9th century. But the dirham hoards of this period in particular contradict this. They can be interpreted in terms of either silver wealth or of a general silver crisis during the final quarter of the 9th century. According to my argument, the idea of a silver crisis is primarily a product of the numismatic calendrical dating, which prioritizes the period of minting and not the period of the import and use of the dirham silver. A discussion of the period of use of dirham silver therefore needs to be based to a considerable extent upon comparative studies between hoards and individual coin-

Figure 7.19 *Hoard from Westerklief II, island of Wieringen, The Netherlands (t.p.q. 875). Photo, Besteman 2004a:97, fig. 2.*

finds from more closely datable settlement contexts.

Most 9th-century dirham hoards in Northern and Eastern Europe have a latest coin date between c. 860 and 875. A prominent feature of these finds is that they have a clearly distinctive chronological age-structure. They contain relatively large quantities of 9th-century dirhams and a higher proportion of recently struck dirhams than earlier hoards. But their composition is still dominated by coins struck in the 8th century or at the beginning of the 9th. Rather than a silver crisis in the East, the hoards could really show quite the opposite. Basing oneself upon the individually found dirhams and the hoards one may suspect a quantitative surge in the access to dirham silver in phase IVa (below, 7.8).

On a regional level too, it is possible to trace changes in this period. Dirhams were spreading from the silver-using core-areas of the Baltic Sea zone further west to other parts of Scandinavia, and yet further westwards still to the border zones of the Carolingian kingdom and Anglo-Saxon England. In Southern Scandinavia, this is evident not in the form of dirham hoards but rather through large numbers of individual coin-finds at trading sites such as Kaupang. The Western European coin-finds containing dirhams show that larger quantities of Islamic silver were reaching parts of the Frisian coast and areas of England, after c. 870 at least. In this way, the dirham silver that came via Eastern Europe achieved its widest geographical distribution beyond the borders of the Caliphate. The dirham finds of Western Europe and also from Kaupang can thus be incorporated into the end of a process that began in the Southern Caucasus some hundred years previously.

7.7 The Samanid find-period after AD 890 (Phase IVb, t.p.q. 890–920)

Large-scale recycling of Abbasid dirham silver was to be found over wide areas of Scandinavia and certain parts of North-Western Europe after about AD 860; post-870 at the latest. This was before the influx of Samanid coins that started at the beginning of the 10th century. The large quantity of Abbasid dirhams from Kaupang fits this situation well. Instead of a silver crisis, we can assume, in all confidence, that use was made of dirham silver to a greater extent than had previously been thought. Through the large number of individual finds of Abbasid dirhams in Charlotte Blindheim's excavations, activity in the settlement area of Kaupang appeared to have been limited to the 9th century. However the archaeological dating of the extensive cemetery material shows that many of the burials in the grave-field around the settlement were made in the 10th century too (Blindheim et al. 1981:183–4) The newly undertaken review of the entire cemetery evidence from Kaupang confirms this and thus constitutes clear evidence of activity in the 10th century (Stylegar 2007:81). The investigations at Kaupang since 1998 have produced a small number of Samanid dirhams that show that activity in the settlement area may have continued as late as c. 960–980 (see Blackburn, this vol. Ch. 3:54). In this regard it is of great significance to establish how long Abbasid silver coin continued to circulate at Kaupang. Was the circulation of Abbasid coined silver confined to the 9th century or is there evidence that it was still used on a considerable scale in the 10th? To answer these questions we have to take a closer look at the point at which Samanid silver coin made its appearance in Scandinavia.

The Samanid transitional phase according to hoard-finds

In the year 892/3, the Samanid emirs began to strike coins in Transoxania in Central Asia. The huge level of minting under the Samanids was apparently based upon the extraction of silver from the rich silver mines of Shash, now Tashkent, and Panjshir in Afghanistan (Noonan 2001:153). Analyses of dirham finds from the 10th century show that Samanid dirhams came rapidly to dominate some hoards in Central Europe. The early Samanid hoard of Klukowice (t.p.q. 901/2) by the river Bug in the interior of Poland, can be taken as an example. Both geographically and chronologically, the hoard is extremely compact in composition. There are few Abbasid coins in the find. More than 90% of the coins are newly struck Samanid dirhams from the mints of al-Shash and Samarkand in Transoxania. The chronological range is no more than 25 years and is concentrated in the 890s and 900s (Noonan 1985:48–9, chart X; Brather 1997:99–100, figs. 8 and 9:1).

An early transition from Abbasid to Samanid importation can also be traced in a number of Scandinavian hoards, such as, for instance, from Viken in Hälsingland (t.p.q. 906/7) with 78% Samanid dir-

Find	Region	T.p.q.	Total	Samanid	Samanid (%)
Lingsarve	Gotland	896/7	244	2	0.8
Lilla Hammars	Gotland	903/4	281	58	20
Buters	Gotland	906/7	30	14	47
Viken	Hälsingland	907/8	195	152	78
Lilla Veller	Gotland	907/8	55	29	52
Bote	Gotland	912/3	99	69	70
Stora Velinge	Gotland	910/1	2674	117	4
Ockes	Gotland	911/2	261	64	25
Högby vicarage	Öland	915/6	7	100	100
Kännungs	Gotland	917/8	81	65	80
Ytternora	Dalarna	918/9	25	3	12
Österlings	Gotland	919/20	33	33	100
Säby	Öland	920/1	17	15	88
Ingvards	Gotland	922/3	92	79	86
Norrvange	Gotland	923/4	82	32	39
Lilla Bjärges	Gotland	928/9	44	44	100
Lilla Bjärs	Gotland	930/1	133	128	96

Table 7.12 *Proportion of Samanid coins (including Volga Bulgar imitations) in Gotlandic and Eastern Scandinavian hoards with t.p.q.'s 896–930. Hoards of more than five coins only (Landgren database).*[39]

Find	Region	T.p.q.	Total	Samanid	Sam. %	English
Over Randlev I	Jutland	910/1	234	112	48	1
Slemmestad	Aust Agder	915	5	4	80	1
Sandvikstorp	Bohuslän	916/7	26	21	81	-
Harka	Uppland	917	27	25	93	-
Sigerslevøster	Sealand	921	52	39	75	3
Grimestad	Vestfold	921/2	77	70	91	-
Bräcke	Skåne	924/5	129	114	88	1
Oppmanna	Skåne	924/5	34	33	97	-
Bunkeflo	Skåne	928/9	52	41	79	-

Table 7.13 *Proportion of Samanid coins (including Volga Bulgar imitations) in selected hoards from the Swedish mainland and Southern Scandinavian, t.p.q. 910–28. (Skaare 1976, 1982; Kromann 1990:185–6, tab. II–III; Rispling, in prep.).*

hams, or Bote on Gotland (t.p.q. 912/13) with 70%. Nearly all of the coins in the Viken hoard come from mints in Transoxania. Like Klukowice, then, this find has a virtually homogeneous composition geographically (Landgren database). The inception of Samanid minting and the rapid transition to the find-horizon dominated by Samanid coin has also been taken as a basis for distinguishing between dirham finds before and after c. 890, which has in turn been applied to a series of archaeological studies (e.g. Jansson 1985:124; Gustin 2004b). The Samanid find-horizon dates archaeological contexts of the 10th century; the Abbasid-dominated phase generally coincides with 9th-century contexts. I shall argue, however, that the early Samanid hoards alone cannot be taken as proof that the great wave of Samanid coin came to dominate the circulation of silver in Scandinavia almost immediately after its arrival, namely around the year 900, as is generally supposed to have been the case.

The table below shows that the percentage of Samanid dirhams in hoards from Sweden of phase IVb varies from 4% to 100% (Tab. 7.12). This is not least the case with hoards on Gotland. The early Samanid hoards in Sweden contain from 30 to 250 coins and are smaller than the hoards of phase IVa. One exception is Stora Velinge, Gotland, with more than 2,600 specimens. Only 4% of Stora Velinge consisted of Samanid coins and the hoard is reminiscent both in size and composition of the great hoards of phase IVa (Sawyer 1971:229, fig. 19; see also below, Ch. 7.8 and Fig. 7.21).

From the first decade of the 10th century it is principally hoards in Gotland and Hälsingland to the North of Central Sweden that contain high proportions of Samanid dirhams (i.e. from 20 to 78%). There is, however, an exception to this regionally limited distribution of early Samanid hoards in the case of the find of Over Randlev I in East Jutland (t.p.q. 910/11; Tab. 7.13, Fig. 7.20). Hoards with higher proportions of Samanid coin do not appear elsewhere in Scandinavia before finds with t.p.q.'s post-915 (Tab. 7.13). Several of the earliest dirham hoards of Southern Scandinavia, especially those on the Danish islands, Jutland and Skåne also contain a small number of 10th-century English pennies (Tab. 7.13). Sigerslevøster, for instance (t.p.q. 921/2), is dated by one English and one Samanid coin (Rispling, in prep.). This means that the t.p.q. is reliable in this case, as both the latest dated Western and Oriental coins agree in date.

It is of interest that dirhams, including Samanid specimens, are also represented in the earliest Irish hacksilver hoards of Viking-period character, such as Millockstown (t.p.q. 905) and Dysart Island (t.p.q. 907) (Ryan et al. 1984; Sheehan 1998:169, tab. 6.1). The find from Dysart Island has a close agreement in the latest coin dates of Islamic and Western European types. The latest Samanid coin was struck in the year 902/3 and the newest Anglo-Scandinavian coin post-905 (Kenny 1987:509). It is also of interest that the hoard from Cuerdale (t.p.q. 905), on the other side of the Irish Sea in North-Western England, has nearly the same latest coin date as Dysart Island (Archibald 1992; Fig 8.21). Here too there was a high number of dirhams and here too the chronological discrepancy between the latest dated Islamic and Western European coins was relatively narrow. The most recent Islamic coins were not Samanid dirhams but coins struck in the years between 890 and 895 at Abbasid mints such as Arminiya in the Caucasus and Madinat al-Salam (McCormick 2001:821).

Figure 7.20. *Early Samanid hoard from the Viking-age village of Randlev on Jutland. The hoard, which is now exhibited at the National Museum in Copenhagen, was discovered in 1932. Later excavations conducted by Moesgård museum revealed that the hoard was concealed in a sunken hut that had been used as a smith's workshop. Photo, Moesgård Museum, Århus.*

This means that Samanid dirhams – soon after they were struck – were carried at the beginning of the 10th century direct to Gotland and from there to regions lying around the Irish Sea. A possible link between these two poles is the North and East of Jutland. The earliest Samanid hoard of Southern Scandinavia has been found here: Over Randlev I (t.p.q. 910/11) (Fig. 7.20) (von Hejne 2004:365). An even earlier dirham hoard with late Abbasid dirhams is from Koldemosen north of the Limfjord (t.p.q. 897) (Skovmand 1942:133, n.2; von Heijne 2004:353). Gotland is thus the earliest region in the Baltic Sea zone that was supplied with Samanid dirhams, and subsequently passed the silver on westwards. This is corroborated by the Irish hoard from Dysart Island which also included a fragment of a typically Gotlandic armring (Sheehan 1998:171, fig. 6.2). Gotland was thus one of the few places in Northern Europe which succeeded in maintaining contacts eastwards in the find-poor period. Deposition on the island of Gotland continued even after c. 875 (above, 7.6). The latest coin in Gotlandic hoards of the 880s is either from the Caucasus or from mints that subsequently belonged to the Samanid state. Interestingly, the very early Samanid hoard from Klukowice (t.p.q. 901/2) in the interior of Poland, already mentioned, also lies in the region in which we find hoards deposited after 875, in the find-poor period, such as Czechów (t.p.q. 882/3) and Drohiczyn (t.p.q. 893/4) (Bartczak 1997: 233–4). Thus it would appear that the massive importation of Samanid silver did not start immediately, as is often assumed, but was heralded by hoards in the same region with t.p.q.'s in the 880s and 890s (Fig. 7.21).[40]

This means that the inflow of Samanid coin was at first sporadic in Scandinavia and Eastern Central Europe, and confined to particular areas. My view is that the rapid transition in the importation of Samanid silver at the beginning of the 10th century, and the conclusions we choose to draw from that, thus depend upon which region we decide to study. To go by t.p.q.-figures, Samanid silver coin starts to be dominant in the Gotlandic hoards between c. 905 and 910; in Hälsingland and Northern Jutland before c. 910; in Skåne, Bohuslän, Aust-Agder, Norway, maybe also Uppland in Sweden after c. 915 at the earliest (Tab. 7.13). In the areas around Kaupang – in Vestfold and the inner Oslofjord area – we have no evidence of Samanid hoards until after c. 920. This outline of regional development in the pattern of importation may, of course, be changed by further finds, but what is crucial is to distinguish the Gotlandic hoards and to treat them as a separate group of finds in evaluating the first phase of Samanid supply. The earliest Samanid hoards on Gotland, in the interior of Poland, in Ireland and in the west of Den-

39 The percentage of Samanid coins differs in some hoards according to the figures presented most recently by Noonan (2001:149–50, tab. B). This may be due to differences in the total number of dirhams in individual hoards, and to differences in counting. For instance Noonan has excluded imitations from his figures.

40 The conspicuous concentration of late Abbasid and early Samanid hoards in Western and Southern Russia with t.p.q before 910 (Brather 1997:139–40) are not further discussed in this context.

Figure 7.21 *Map showing the distribution of late Abbasid (red) and earliest Samanid (yellow) hoards in the Baltic Sea and North Sea zone, Central and North-Western Europe (t.p.q between 880 and 910). Map, Julie K. Øhre Askjem, Elise Naumann.*

mark, give the impression of being the product of direct connexions between the areas of origin and the area of deposition of the coins. A further conclusion to be drawn is that the importation of Samanid dirhams was initially limited and not immediately expanded over a greater area. The delayed influx of Samanid coin was therefore primarily the result of how contacts and the exchange of dirham silver were organized. It had less to do with geographical distance and travelling time.

The Samanid find-period in archaeological contexts

Ola Kyhlberg (1980a:54–6) has reached a similar conclusion – albeit from an archaeological perspective – in relation to his stratigraphical study of the wharves that were examined in the harbour area of Birka in 1969–71. The stone-packing of the wharf was dated by Kyhlberg to the period 920–40. This forms a stratigraphical dividing line between two separate dirham phases. The layers below the stone-packing contain no Samanid dirhams, only Umayyad and earlier Abbasid coins. The layers above reveal a mixed phase with coins of the 8th to 10th centuries (Jansson 1985: 180). The excavators of buildings in the hillfort at Birka were faced with the same problem as in the harbour area. Archaeologically unambiguous 10th-century contexts, such as the hall on the upper terrace, were dominated by earlier Abbasid dirhams struck before 890. If the structures were really of the 10th century, one ought to see a much higher proportion of Samanid coins (Jonsson 2001).

That Samanid coin only began to circulate in the settlement area well into the 10th century has been shown clearly by the most recent excavations in the Black Earth. Ingrid Gustin (2004b) and Gert Rispling (2004a) have recently published the dirham finds from the latest archaeological work in the settlement area of Birka. Some 60–70 coins could be located stratigraphically. According to the preliminary stratigraphical study, only a few dirhams are from layers pre-dating the 10th century. The quantity of coins grows in later 10th-century layer, and their frequency is greatest in the plough-layer. Samanid coins do not appear before phase 8, which is immediately below the plough-layer.[41] Most of the dirhams were in fact recorded in the unstratified ploughsoil. This assemblage is dominated by Samanid dirhams, although there are also a few Abbasid specimens (Rispling 2004a:42–56).

There is now ample evidence that non-Samanid dirhams are the dominant types in many 10th-century contexts at Birka. The various stratigraphical contexts give us some clues as to *when* the inflow of Samanid dirhams had an effect on Birka. These contexts have wide chronological margins. The stone-packing in the wharf-structure that was examined in 1969–71 should, according to Kyhlberg, be dated between 920 and 940. Phase 8 in the settlement area is dated in Björn Ambrosiani's preliminary scheme no earlier than c. 930. This can be interpreted in terms of the first Samanid dirhams reaching Birka at the earliest between c. 920 and 930. However we must bear in mind that work on the phasing of the most recent investigations at Birka is not concluded yet, and the time-frame may change. Finally, Blackburn takes a different position on the interpretation of the settlement finds from Birka. Even though the results from the excavations in the Harbour and the Black Earth could indicate that Abbasid dirhams dominated coin circulation in early 10th-century Birka, he regards the stratigraphical evidence as still too ambiguous, and thus difficult to interpret (this vol, Ch. 3.2.7).

The dirham network in the Samanid silver period

In spite of Blackburn's objections, there is still good reason to believe that the introduction of Samanid silver to Birka did not begin around the year 900 but significantly later. The question is, whether one can observe such a late transition at other sites too. Comparable, well-documented, stratified contexts have not yet been found on Gotland, or in any of the other central trading sites of the Baltic Sea zone. But the situation at Birka is similar to what we see at Kaupang in many ways. The majority of the 10th-century graves form a contrast to the early Abbasid-dominated coin phase in the settlement area. The new reassessment of the cemetery evidence has indicated that a large number of people were resident at Kaupang during the first half of the 10th century (Stylegar 2007:81 and 86). What, then, is the explanation of the later introduction of Samanid dirhams that appears to characterize both Kaupang and Birka?

In order to answer this question we need to shift our attention far to the East, to the kingdom of the Volga Bulgars in Russia (see map, Fig. 7.3). Amongst the finds from Kaupang there is an imitation of a Samanid coin struck in Volga Bulgaria (see Rispling et al., this vol. Ch. 4:Nos. 86–7). Through both documentary and numismatic sources we know that Samanid dirhams passed through a central, intermediary area on their way from the Caliphate to Scandinavia, namely the Volga Bulgar kingdom in the lower Volga Crook (Noonan 2001). The Volga Bulgars produced their own dirhams on a considerable scale, copying Samanid coins (Rispling 1990). Numismatic studies have shown that the importation of Samanid coin was more homogeneous and consistent than that of Abbasid coin in the 9th century. In several mint-places, coin-production can be studied in detail with the aid of die-studies on Swedish dirham finds in a way that is not feasible with the Abbasid mints (Rispling 2005b). This means that Samanid coins were carried more directly to Scandinavia from their places of production and use. The typically compact composition of the Samanid-dominated dirham hoards thus provides us with further indications of *how* the contacts with Eastern Europe concerning dirhams were structured in the 10th century. As I understand it, this is a key piece of the jigsaw to help us understand the distinctive find-situations of Birka and Kaupang.

The homogeneous Samanid hoards provide evidence of dirham networks that were organized on a regional basis. It was these networks which established and maintained direct contacts with the territory of the Volga Bulgars. The early Samanid hoards on Gotland probably show that the first contacts established in Scandinavia were with that area. The late Samanid find-horizon in the stratified layers of Birka is evidence of non-involvement in this initial phase and, rather, that contacts with the East were first maintained via the River Volga at a later date. There is clear regional variation in the occurrence of Samanid dirhams all round the Baltic area. This helps to strengthen the view that these networks were responsible for the peculiar situation in respect of finds of Samanid silver. One example of regional variation in this phase is the remarkable situation in Åland. Here there are a number of dirham hoards from both the 9th and the 10th centuries. Interestingly, there is a marked lack of dated finds from the 870s to the 950s. One exception is a small hoard of four coins with a t.p.q. of 915/16 (Talvio 2002:45).

We can also explain individual early Samanid hoards such as, for instance, Viken in Hälsingland and Over Randlev in Jutland (Fig. 7.20) in this way. In my view, these can be explained as the traces of individual entrepreneurs who apparently participated personally in the early contacts along the River Volga. Another possibility is that people immediately got hold of the Samanid silver coin via the networks that were operating in the Volga Bulgar area. These regional differences are most evident in the phase of establishment but diminish bit-by-bit as Samanid silver begins to be used outside of the Volga Bulgar networks too. I believe, therefore, that we ought to distinguish the early Samanid hoards as a separate group of finds. From this interpretative angle, Kaupang – like Birka – was also outside of these networks in the establishment phase. Consequently, the dominance of Abbasid dirhams at Kaupang can no longer be used as a basis for limiting the main activity in the settlement area to the 9th century. It quite certainly continued well into the 10th. In Southern Scandinavia and in mainland Sweden the importation of Samanid silver did not begin – according to the evidence of t.p.q.'s – until after c. 915/920. The Samanid hoard from Grimestad in Vestfold (t.p.q. 921/2) shows that Samanid silver reached the area around Kaupang at the earliest in the 920s. This is the same period as that in which Samanid coin importation appears at Birka. But that is where the similarities end. Kaupang did not subsequently follow the same course of development as Birka. The absence of significant quantities of Samanid silver that we should otherwise expect shows that Kaupang remained out-

41 The stratigraphical chronology from the most recent work at Birka is still being worked on. Björn Ambrosiani has dated the beginning of Phase 8 no earlier than c. 930 (pers. comm.).

side of the super-regional dirham-network systems of the 920s and later. Its importance as a major place of exchange of dirham silver in the Oslofjord area had probably come to an end. The late Samanid coins – four specimens struck from 945 to 951 – make no difference to this view. They cannot be taken as evidence of continuous and extensive activity in Kaupang after c. 920/30.

Conclusions

A series of studies have treated the Samanid silver as a key criterion for distinguishing 10th-century from 9th-century contexts, while at the same time the Samanid dirhams mark the establishment of comprehensive contacts with the lower Volga region and the Islamic world of Central Asia. However, studies of the composition of coin hoards and stratified archaeological contexts may indicate that the importation of Samanid dirhams did not start at a single time across Scandinavia; rather, they show different regional histories.

The analysis of the composition of the hoards provides good evidence which suggests that Samanid dirhams were found in circulation on Gotland from the beginning of the 10th century, but only later at Birka and in Southern Scandinavia. Stratified contexts at Birka strongly imply that the use of Samanid silver began there at the earliest around 920 or even later. It is in fact old 8th- and 9th-century dirhams that predominate in the various archaeological contexts of the first quarter of the 10th century in Birka. This indicates continuity of circulation and use of Abbasid and even to some extent also earlier Umayyad silver coin for some time into the 10th century. The dirham finds from Kaupang are clearly very similar to Birka in this respect.

The regional variation in the Samanid horizon is primarily the product of an exchange network that established direct contacts with the Volga Bulgar area at the beginning of the 10th century. It was via the Volga Bulgars that Samanid silver was channelled directly from Central Asia to Scandinavia. This has far-reaching implications for dating archaeological contexts by means of Islamic coins, at least outside of Gotland. The Samanid coins thus cannot be used as a numismatic "leading type" for distinguishing the Early Viking Age from the Middle Viking Age at sites like Birka and probably also at Kaupang: i.e. between the period before and that after 890/900 (Jansson 1985:124; Gustin 2004b:100). The significance of Kaupang as a site at which dirham silver was handled apparently disappeared just as the wave of Samanid silver broke on Southern Scandinavia. The use of dirhams and probably that of silver in general then reached other parts of the population beyond these sites.

	Hoards	Dirhams	%	Dirhams per hoard
phase I	9	376	0.6	42
phase II	59	7,250	11	123
phase III	43	13,125	20	305
phase IVa	68	44,982	68.4	662
	179	65,733		

Table 7.14 *All hoards containing dirhams from phases I–IVa. Mean number of dirhams per phase calculated. Western European hoards containing dirhams omitted.*

	Number of hoards	Number of dirhams
phase I	-	-
phase II	1[43]	1,700
phase III	4[44]	6,103
phase IVa	9[45]	35,352
	14	43,155

Table 7.15 *The largest dirham hoards, containing more than a thousand specimens.*

7.8 The quantitative jump after c. 860

The aim of this section is to assess the quantitative differences in the finds of the 9th century before the arrival of the Samanid dirhams. Consequently I have not included hoards of phase IVb, i.e. hoards with t.p.q.'s between 890 and 930. There was a massive inflow of dirham silver in Eastern and Northern Europe at the earliest post-860. This is shown by the composition of all the hoards of the whole Abbasid-dominated period of importation. Hoards of phase IVa, i.e. hoards with t.p.q.'s between 860 and 890, contain 68.4% of all the dirhams that have been recorded as part of this study (Tab. 7.14). It is also of interest to compare the finds of phase IVa with the hoards of phase II, i.e. with t.p.q.'s between 790 and 825. The hoards of phase II constitute the first concentration of finds of the 9th century (Fig. 7.7). Table 7.14 shows that the average number of dirhams per hoard increases fivefold by phase IVa. Here, however, I have not taken account of the many small hoards along the southern shore of the Baltic dated to phase II. These were in all probability imported and deposited no earlier than c. 830/40 or even later (above, 7.4).

There are several hoards of phase IVa with a large number of dirhams that affect the whole picture. This is particularly the case with exceptionally large finds such as the two newly discovered Spillings hoards from Gotland (Fig. 7.18) or the now scattered

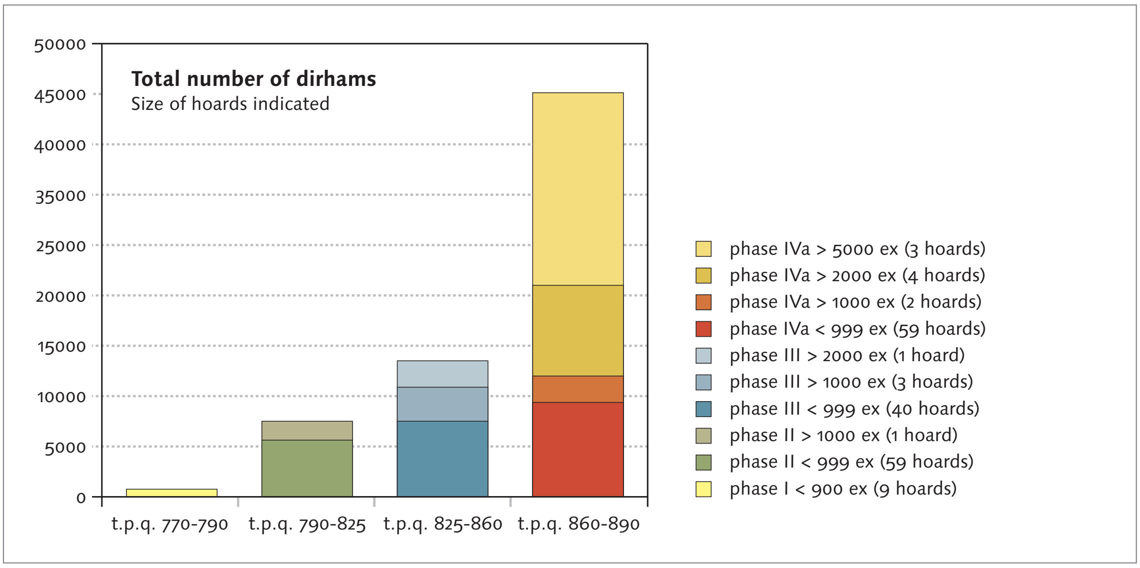


Figure 7.22 *Total number of dirhams in hoards in phases I–IVa respectively. Size of hoards indicated.*

hoard from the province of Vitebsk in Belorus.

An overview of the entire period of study shows that large hoards which contained more than a thousand dirhams account for only 7% of the total number of individual finds, but contain two-thirds of the total collection of coins (Tab. 7.15).[42] It is therefore of interest to take a closer look at *when* the large dirham hoards begin to appear in the 9th century. In phase II there is only one single known hoard containing over a thousand dirhams. This is a find from Russia. In the Baltic Sea area hoards with large numbers of dirhams start to become familiar in phase III. Here, these appear post-c. 840 (above, 7.5). But it is only finds with t.p.q.'s post-860 that include several containing more than 2,000 dirhams. The number of large finds rises from four in phase III to nine in phase IVa, but the number coins increases more than fivefold (Tab. 7.15). Phase IVa thus marks a quantitative jump in the quantity of Abbasid silver that was in circulation in Scandinavia and Eastern Europe. This quantitative shift within the Abbasid-dominated inflow seems to me to have a clear effect on the use of silver coin as late as the beginning of the 10th century. The circulation of primarily Abbasid silver is superseded only by the massive influx of Samanid dirhams. This makes its quantitative breakthrough first of all on Gotland, from c. 905, and subsequently in all parts of Scandinavia after around 920.

The following histogram (Fig. 7.22) portrays the quantitative differences between the phases that have been discussed above. Hoards with more than a thousand dirhams are presented and calculated separately in the columns.

The quantitative shift that can be traced in phase IVa depends first and foremost on a number of huge, coin-rich hoards. This can be interpreted as showing that the use of dirham silver in the 9th century was nurtured and controlled by a small number of players. It may also show that the dirhams passed through only a small number of stops or collection points. On Gotland, dirham silver is concentrated in large hoards together with unminted ring and ingot silver. The finds from, for instance, Spillings weigh up to several tens of kilograms. Along the southern shore of the Baltic the dirham silver appears, by contrast, to have had a wider distribution as early as the second quarter of the 9th century. This is shown by the large number of small hoards, but also by comparison with other find-regions that lack the same density of finds in the 9th century as we have in the West Slav and Prussian area. It is striking that the small West Slav and Prussian hoards do not, as a rule, contain any unminted silver.[46] This is also the case with all of the

42 No account has been taken here of the growing corpus of individual finds of coins and of small hoards of fewer than five coins.

43 Belorussia: Orsha (t.p.q. 814/5), 1,700 ex.

44 Russia: Uglich (t.p.q. 828/33), 1,114 ex.; Vyzhigsha (t.p.q. 841/2), 1,278 ex.; Iagoshury (t.p.q. 843/4), c. 1,500 ex.; Southern Baltic shore: Ralswiek (t.p.q. 841/2), 2,211 ex.

45 Belorussia: Baevo (t.p.q. 862?), 2,000 ex.?; Vitebsk (t.p.q. 866?), >10,000 ex.; Russia: Bol' soe Timerevo (t.p.q. 864/5), 2,751 ex.; Shumilovo (t.p.q. 870/1), 1,326 ex.; Khitrovka (t.p.q. 872/3), 1,007 ex.; Mainland Sweden: Äskedal (t.p.q. 864/5), 2,049 ex.; Gotland: Spillings III (t.p.q. 867), c. 5,100 ex.; Spillings IV (t.p.q. 870/1), c. 9,100 ex.. I have also included the hoard from Skarpa Alby, Öland (t.p.q. 894/5), 2,022 ex., which has two Samanid coins (Landgren database).

46 Exceptions that I have been able to record are the large dirham hoards from Prerow Darss (t.p.q. 802/3) and Ralswiek (t.p.q. 841/2).

9th-century dirham hoards grouped around Birka in mainland Sweden.[47] There are neither ring nor ingot hoards in this area that can be dated to that century. This may show that silver was used in Birka only in small portions. That would be congruent with the earliest archaeological evidence of Oriental cubo-octahedrical weights in Birka, which also are dated at the latest to the 860s (Gustin 2004c:310–14). These types of weight were probably used for the fine-weighing of silver in portions below c. 4 g (Steuer 1997:283–4; Kilger, this vol. Ch. 8.5).

The earliest dirham and hacksilver hoards of Southern Scandinavia show that silver coins reached several users and thus a larger part of the population there. This coincided with the breakthrough of the tide of Samanid coin in the second quarter of the 10th century. The dominant 10th century that I have introduced was therefore not only a reflex of the amount of silver that was in circulation (above, 7.1). The handling of dirham silver was in equal measure a result of the changes in the exchange networks that organized the distribution of the dirhams, and also of the way in which silver was handled and valued: sometimes as fragmented hacksilver (Kilger, this vol. Ch. 8.5), or in the form of whole, ingots or silver rings (Kilger, this vol. Ch. 8.4).

Calculations based on the number of coins can only give us an approximate view of the size of the dirham hoards; not of the total weight of silver in the hoards. The uncoined silver has not been included in the reckonings. This understanding of the use of silver in the 9th century is one-sided, as a result, and needs to be filled out with comparative studies between silver coin and unminted silver. The phasing of the dirham finds that I have presented in this chapter may, in the concluding section which follows, serve as a starting point for locating the Kaupang finds and the numerous but coinless Southern and Western Scandinavian ring and ingot hoards of the 9th and 10th centuries in a wider chronological, geographical and culture historical context (Skovmand 1942: 28–43; Hårdh 1996:78–83; above, 7.1).

7.9 Final Conclusions

The dirhams from Kaupang can be associated with a larger set of finds that can be traced back in time to the last quarter of the 8th century. The geographical distribution of the dirham hoards reveals not only direct or indirect contacts with the Caliphate but above all how dirham silver was used in the area in which they were found. The dirham hoards can thus also be understood as a material expression of regular patterns of trade and trust-enhancing conventions that were developed from the growing long-distance trade of the Early Viking Period, but which also influenced and changed that trade over the longer term (Sindbæk 2005). Exchange networks were created as a product of dynamic interaction between different agents who spoke different languages and were of different cultural backgrounds. In this context, I have attempted to shift the perception of archaeological and historical studies of transit trade using dirham silver in the Early Viking Period by using a different perspective (e.g. Jankuhn 1952; Bolin 1953; Noonan 1980; Hodges and Whitehouse 1983).

My alternative argument is for the establishment of the use of dirham silver as an accepted token of value within any region in which dirhams are found. Thus, the dirham hoards do not just reveal contacts between various regions during the Viking Period but, rather and above all, the exchange of silver. This process is the result of the fact that a silver object such as a coin or silver ring no longer retains and constrains the giver's personal qualities but can rather be disposed of as an impersonal trade good between two parties to an exchange. In this case, coins are no longer meaningful artefacts but simply silver that can be measured and valued according to weight and purity (Kilger, this vol. Ch. 8.5). They are broken up and tested. The dirhams themselves are often in fragments in the hoards. This *amorphous* silver, i.e. not of any fixed shape, was handled and measured with the help of standardized precise weighing equipment such as spherical and cubo-octahedric weights. This is the apparatus that characterizes the Eastern *Gewichtsgeldwirtschaft* (Steuer 1987, 1997). The use of scales and weights as conventional exchange equipment is itself the result of an extended and to a very high degree culturally governed process of assimilation (e.g Gustin 2004c).

The following diagrammatic representation is a summary of the regional development of how dirham silver was treated in the 9th and 10th centuries in Northern and Eastern Europe (Fig. 7.23). The picture shows both the regional development of the pattern of deposition and the phasing described above. One significant result is that this study has been able to show that the use of Abbasid dirham silver in Europe spread in stages. Something that emerged clearly in the review of the phases was that dirham hoards do not appear at the same date over a wider geographical area. There is a manifest discrepancy in date in the regional pattern of deposition from East to West. The use of dirham silver – as weighed silver – began after about AD 770 in the Southern Caucasus, and had reached the monetized regions of North-Western Europe some hundred years later, after 870. Deposition in each region is often heralded by isolated

47 This applies to all silver hoards north of Småland and Öland. Gästrikland: Häcklinge (t.p.q. 857/8); Uppland: Birka 1991 (small) (t.p.q. 810/1); Wäsby (t.p.q. 832/3); Helgö (t.p.q. 856/7); Fittja (t.p.q. 866/7); Översävja (t.p.q. 892/3); Södermanland: Långhalsen (t.p.q. 865/6); and Östergötland: Hällestad parish (t.p.q. 862/3).

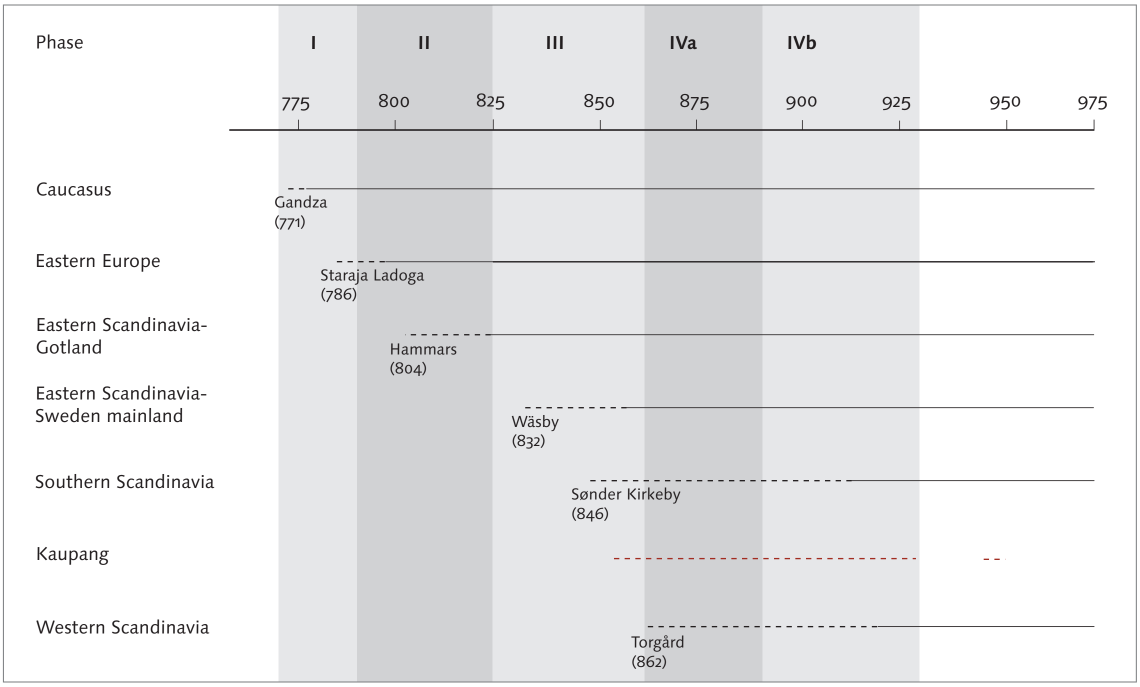


Figure 7.23 *The regional pattern of dirham hoarding in the Caucasus, Eastern Europe and Scandinavia, related to different phases of importation from the East (dirham hoards from East Central Europe and North-Western Europe not included). The established use of dirham silver indicated regionally (black line); an inconsistent pattern of hoarding, marked by the earliest hoards (dotted black line); the possible extension in time of the circulation of dirhams at Kaupang (dotted red line).*

hoards that are earlier in character both in terms of dating and composition. The diagram shows these as black dotted lines. The black lines mark the continuous use of dirham silver in the region concerned. The beginning of the black line indicates when the hoards appear in a more concentrated form in the region, as indicated by t.p.q., composition and size. We must note, however, that the t.p.q. value does *not,* as a rule, show the date of importation or deposition itself (see the methodological principles, above, 7.2). The preliminary phase may therefore be shorter than is suggested in this diagram.

A further conclusion is that neither concentrations of finds nor the absence of dirham finds in Eastern and Northern Europe can validly be used as a basis for assessing the character of economic development within a region, or for postulating silver crises. The occurrence of hoards has sometimes been interpreted in terms of passive or primitive capital that is not used in transactions and thus has no economic implications (e.g. Callmer 1980; Malmer and Rispling 1981; Holm Sørensen 1989; Brather 1997:81). To classify areas as find-rich and find-poor according to a scale of values based upon wealth and economic development does not, as I see things, lead us on to any understanding of *why* dirham hoards start to be found. The distribution of finds that we can observe is primarily the result of the establishment of a series of exchange networks in Eastern and Northern Europe, while at the same time it reflects the conventions within the various regions concerning how precious metal such as silver is valued and how it is supposed to be handled.

The dirham finds from Kaupang revisited

Although most of the dirhams from Kaupang were struck in the 8th century or early in the 9th, they apparently did not reach the settlement area until post-c. 850 at the earliest. This is implied by their stratigraphical situation, and by the test-marks on the coins. Nicked coins are much more common in Scandinavian finds of phases II and III: i.e. in finds with t.p.q.'s between 790 and 860. Here the marks are found on nearly all the coins. Nicking diminishes markedly in phase IVa, i.e. in finds with t.p.q.'s between 860 and 890. At Kaupang, the proportion of nicked coins is very low, at 15%. This indicates that most of the coins came into circulation at Kaupang only in the second half of the 9th century. In phase IVa there was also a sharp increase in the frequency of deposition and the number of dirham hoards in Northern and Eastern Europe (Fig. 7.7). Hoards with t.p.q.'s between 860 and 875 are more common than any others of the 9th century (above, 7.6). Similarly, the volume of coin in these hoards reveals a very clear quantitative increase in the amount of dirhams and thus in the accessibility of silver (above, 7.8). But the t.p.q.-figures do not provide direct evidence of the date of importation or deposition in the area in which the finds are made. Consequently I disagree with Thomas Noonan's idea of a short-lived silver boom following 860 that was followed by a silver drought after c. 875.

But is it possible for us to identify this silver rush in the Kaupang finds too? Here we are faced with a methodological problem concerning whether it is possible to compare diverse classes of find such as hoards and individual finds of coins from a settlement site. Individually found coins represent random loss from the original coin-stock that was in circulation in the settlement area. Whether or not hoards are comparably representative of the use of silver coin in the area of deposition is, however, a matter of debate. Johan Callmer (1980) has proposed the concept of two different spheres of circulation, within and outside of the early Viking-period trading sites in the Baltic Sea zone; the purpose of this is to explain the difference between the coin-assemblages of the hoards and at the trading sites (above, 7.1). In the case of Kaupang, there is no immediate comparative material in Southern Scandinavia. The dirham hoards of the 9th century are here conspicuous for their absence. The closest area of hoards in geographical terms is in Eastern Scandinavia, in what is now Sweden and on the find-rich islands of Gotland and Öland. But is there a correspondence there between the composition of the settlement finds from Kaupang and the dirham hoards of Sweden? I shall confine myself here to a simplified comparison of the chronological composition of the Kaupang dirhams and selected Swedish hoards.

We now know that the Kaupang dirhams, according to their stratigraphical position, began to circulate at that settlement site from around the year 850 at the earliest. These coins ought therefore to have their closest matches both geographically and chronologically in Swedish hoards of phase IVa, with t.p.q.'s from 860 to 890. The proportion of dirhams at Kaupang that can be securely dated to the period corresponding to hoard phase IVa is not easy to establish precisely. In addition to five specimens struck between 860 and 873/884, there are eleven coins that can only be dated in calendrical terms approximately between 833 and 892. These dirhams must therefore be omitted from the comparision. If we also leave out later dirhams such as Samanid coins, imitations, and unidentifiable dirhams, we have 51 coins that were certainly struck before 833 and five definitely post-860. (Rispling et al., this vol. Ch. 4:Nos. 12–78). This means that about 9% of the Kaupang dirhams can confidently be assigned to phase IVa or later. A typical Gotlandic dirham hoard with a t.p.q. between 866 and 874 has from 9% to 22% of its coins struck post-860.[48] In the few Gotlandic finds dated post-880, the proportion rises to 35%.[49] In the hoards from mainland Sweden of phase IVa the proportion never exceeds 9%.[50] On the premiss that we can use the Swedish hoards as comparative material, we have two conceivable options for explaining the chronological composition of the dirhams at Kaupang: either the influx of dirham silver to the settlement site came to an end already within the second half of the 9th century, and was never supplemented with Abbasid coins struck post-873, or the coins came from a region *other than* Gotland. I would suggest that there are several considerations that support the latter alternative.

Mainland Sweden appears here to be a plausible candidate for an area that functioned as the immediate point of contact that provided Kaupang with dirhams. Mark Blackburn has made use of the find from Äskedal-Loftahammer in Småland (t.p.q. 864/5) to demonstrate the similarities in chronological composition between the settlement finds from Kaupang and this hoard (Blackburn 2005c, this vol., fig. 3.14a). There are also several pieces of evidence indicating that the coin-stock we have at Kaupang finds parallels in finds along the coastline of mainland Sweden but not on Gotland. Another characteristic feature of the Gotlandic hoards of phase IVa is that many of them have Caucasian mints represented amongst the most recent coins.[51] In both of the huge Spillings hoards all of the latest coins are from the northernmost mints of the Caliphate, indicating that the silver came directly via Armenia and the Caucasus to Gotland (Rispling 2004c:123–4). Caucasian dirhams struck after 860, however, are absent both from Kaupang and from nearly all the mainland Swedish hoards.[52] Also, there are only two Caucasian dirhams amongst the large number of individual finds from Birka, one in the hillfort and one from the harbour area (Landgren database).

This suggests the existence of separate exchange networks that lay behind the regional variation in the composition of coin-finds. As we have seen in respect

48 This has been calculated for coins which can be dated to a specific year of issue: Lilla Vägome (t.p.q. 866/7) 9%; Östris (t.p.q. 869/70) 14%; Hemmor (t.p.q. 870/1) 17%; Vikare (t.p.q. 870/1) 17%; Spillings II (t.p.q. 874/5) 22% (Landgren database).

49 Kinner (t.p.q. 883/4) 32%; Sojvide (t.p.q. 885/6) 24 %; Larsarve (t.p.q. 890/1) 35% (Landgren database).

50 Äskedal, Småland (t.p.q. 864/5) 5%; Långhalsen, Södermanland (t.p.q. 865/6) 2%; Broby, Småland (t.p.q. 867) 9%; Fittja, Södermanland (t.p.q. 866/7) 2% (Landgren database).

51 Calculated for the ten latest coins in the hoards: Lilla Vägome (t.p.q. 866/7), 2 ex.; Östris (t.p.q. 869/70), 1 ex.; Vikare (t.p.q. 872/3), 2 ex.; Spillings II (t.p.q. 874), 2 ex.; Bölske (t.p.q. 876/7), 1 ex.; Dals (t.p.q. 880/1), 1 ex.; Kinner (t.p.q. 883), 1 ex.; Sojvide (t.p.q. 885), 4 ex.; Larsarve (t.p.q. 890/1), 8 ex. (Landgren database).

52 With the exception of Broby (t.p.q. 867), 1 ex. (Landgren database).

of the importation of Samanid coin, Gotland was the first region of all in Scandinavia to establish contacts with the Volga Bulgar kingdom no later than the beginning of the 10th century (above, 7.7). This may also explain why different phases of coin, in this case the Samanids, were introduced at different rates in various regions of Scandinavia. According to Callmer's model, we can assume distinct spheres of circulation for dirham silver, but these spheres are not represented by distinct classes of archaeological deposits such as hoards and settlement finds. Nor are they the product, apparently, of the economic and social use of silver. It was primarily the agents of these networks who determined and controlled where, when, how, and in what circumstances, dirham silver came to be used. It is above all the development of these networks that is expressed in the regional distribution of finds and the chronological composition of the finds. To understand the differences in composition between the grave and settlement finds and the hoards the regional variations in the importation of coins have also to be taken into account.

In Figure 7.23 I have given a maximum period of use of dirhams at Kaupang that extends from c. 850 to 920/930. We do not have preserved stratified deposits of the second half of the 9th century, so in consequence it is impossible to be more precise as to when the dirhams were introduced and began to circulate in Kaupang. The dirham finds from Kaupang seem to be a reflection of a quantitative jump in the importation of Abbasid coin that apparently was in evidence after c. 860. But we cannot exclude the possibility that dirhams were already circulating in the settlement before then. The activities that were based upon the exchange and use of Abbasid dirhams at Kaupang came to an end before Samanid silver was beginning to dominate the networks of exchange, likewise in mainland Sweden. The importation of Samanid coin on a large scale in these regions probably began no earlier than the 920s. The Samanid silver boom obviously had no impact upon Kaupang, which gives us a fairly good indication of when the handling of silver and presumably other activities too seem to have ceased in the settlement (above, 7.7). Thus it seems reasonable to suggest that Kaupang lost its importance as a central trading site in the Viken area around 930 at the latest. The few late Samanid dirhams point to some short episode of activity in the 950s, and possibly later too. But the importance of Kaupang as a major place of exchange of silver in the Viken area was long past by then.

Kaupang as a site for the handling and melting down of silver

As has already been discussed, we can take as given the existence of cultural codes and socially defined routines that structured the exchange of silver from region to region in the Viking Period. Such practices also influenced the regional distribution of dirham finds. In this respect, we need to look more closely at the way in which dirham silver came to be used in Northern and Eastern Europe, away from its original area of monetary use: in other words, how silver coin was handled in secondary contexts (Kilger 2006a). Here, we have two conceivable situations. One is that it provided raw material for the production of a range of silver artefacts, including ingots and rings (Arrhenius et al. 1973; Kruse and Tate 1992). In the Early Viking Period these objects commonly observe a standard range of weights in which major units around 50, 100 and 200 g are clearly in evidence (Hårdh 2006:144–6, this vol. Ch. 5:103–7, 111–13). The other is that it was used as weighable and divisible precious metal with people making use of balances and weights to weigh the material precisely, and so to calculate a specific quantity of silver according to both weight and purity.

The dirham silver that was used as goods in Kaupang provides evidence for the existence of both forms of use in the settlement area. The lump of silver containing dirhams shows that silver coin was melted down (Blackburn, this vol. Ch. 3:Fig. 3.1), probably in order for it to be re-formed into various types of silver object. This agrees too with the presence of several ingots of standardized weight and ingot-moulds recorded at Kaupang (Hårdh, this vol. Ch. 5:103–8). The occurrence of fragmented silver, both dirhams and uncoined items, may show that silver was weighed in precise quantities in the settlement. One piece of evidence that supports this view is the presence of a large quantity of diverse types of weight, mostly of lead, but also the standardized Oriental weights (Pedersen, this vol. Ch. 6.1.1). Fragmented silver may have been used at a site like Kaupang as a currency of value in day-to-day, recurrent, and small-scale exchange.

From the stratified contexts it is possible for us to distinguish two distinct phases in the treatment of fragmented silver at Kaupang. During the second quarter of the 9th century we have the earliest archaeologically certain evidence for the use of silver at Kaupang. In this phase hacksilver was used only in uncoined form. Here we also have a small number of lead weights (Pedersen and Pilø 2007:187–8, tab. 9.2). In the second half of the 9th century, no earlier than c. 850, this uncoined silver was supplemented with fragmented dirham silver. But what is the explanation of this marked chronological division in the use of uncoined and minted hacksilver? One possible reason why we do not see any silver coin in the early phase – apart from a few West European deniers and denars – is that it had been melted down into ingots and rings at earlier stages of its distribution, before it reached Kaupang.

This chapter has shown that there is a large number of dirham hoards from as early as the second quarter of the 9th century in Eastern Europe and the Baltic Sea area (above, 7.4). Thus we meet the preconditions for the use of dirhams as raw material for the production of ingots and rings in this area. A possible staging post in the distribution and melting down of dirhams in the first half of the 9th century is Gotland. The earliest dirham hoards of Gotland also have a high proportion by weight of uncoined silver. The dirhams are only a small part of these (Figs. 7.10–11). Very recently it has been possible to identify traces of large-scale silvercasting outside the trading site of Fröjel. The remains of moulds also show that typically Gotlandic silver bracelets were produced here (Gustafsson and Söderberg 2005, 2006). It is a matter of interest that the few 9th-century hoards containing dirhams in Southern Scandinavia are of the same character as the early Gotlandic hoards. An example is Rantrum, Schleswig-Holstein (t.p.q. 873–7), which contained only 13 dirhams. Besides the dirhams, the hoard contained a few fragments of rings, and 34 complete silver ingots. The total weight of silver in the find is 1.906 kg (Wiechmann 1996: 423). Like the other large ingot hoard of Schleswig-Holstein, Witzwort – which has no coins (Wiechmann 1996:527) – Rantrum lies within the same area as Hedeby. This may perhaps show that Hedeby functioned as a central place for melting down silver and the distribution of silver ingots in Danish territory.

Dirhams began to reach Kaupang in the second half of the 9th century. The coins were, with just a few exceptions, extensively fragmented (Blackburn, this vol. Ch. 3.5.1). This dirham-rich phase is elusive in the archaeological contexts as the relevant original layers containing dirhams have been ploughed out. Consequently it is not possible to compare the silver-bearing layers with one another quantitatively. It is highly likely that Kaupang played a central role in the redistribution of silver beyond the settlement to other parts of Norway. The almost complete absence of dirham hoards in Norway in the 9th century shows that dirham silver left Kaupang in a changed form, probably as silver ingots of standard weights in large units. Ingot silver could then be used directly to produce various forms of ring that were used as standard currency in Southern and Western Scandinavia. During the dirham-rich phase, Kaupang fulfilled three different functions at once:

- as a place at which fragmented silver, both minted and unminted, was used, making use of balances and various kinds of weight;
- as a place at which silver was melted down and recast in large portions as ingots;
- as a staging post in the distribution of uncoined silver to the surrounding area, and probably more widely within Western Scandinavia too.

The handling of silver in both larger portions such as ingots and in the smaller portions of hacksilver were probably to be found side-by-side at Kaupang. These two different ways of using silver are not mutually incompatible in the social and cultural environment we can postulate for the settlement (Kilger, this vol. Ch. 8.5). The local treatment and transformation of dirham silver into various forms of silver object at Kaupang and at other similar sites is probably the reason for the clear regional differences in the pattern of deposition in the 9th century between the Baltic Sea zone on the one hand and Southern Scandinavia on the other.

Southern and Western Scandinavia stand out because they do not conform to the pattern of regional establishment in the dirham hoards of the rest of Scandinavia. The quantitative jump in the influx of Abbasid dirham silver in the second half of the 9th century left no mark here in the form of dirham hoards (Fig. 7.17). Rather, the use of dirham silver was restricted to central nodes of long-distance trade such as Kaupang (Sindbæk 2005:70–98). It is also first and foremost in the super-regional nodes that one can find evidence of the craft of casting jewellery (Sindbæk 2005:94–5). The situation in respect of finds of dirhams and hacksilver in Southern Scandinavia may show that the practice of fine weighing gained an early local foothold at the classic Viking-period trading sites such as Kaupang, and also at the earlier central places of Tissø and Uppåkra which, likewise, developed a function as places of exchange of weighed and fragmented silver in the 9th century. Outside these settlement sites silver would only be handled in the form of larger units, primarily in the shape of rings and ingots. It is only in the 920s – if we follow the t.p.q. dates – that we can see a clear horizon of dirham hoards outside of Kaupang too. The practice of fine-weighing was then beginning to spread beyond the trading sites and central places through a larger circle of practitioners, and this left its visible mark in the form of hacksilver and dirham hoards. At this stage Kaupang apparently lost its role as the super-regional node for long-distance trace in the Oslofjord area and the rest of Norway.

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7.10 Check list of dirham hoards found in Europe and the Caucasus region (t.p.q. 771–892)

(>= 5 coins)
gravefinds not included hoards from Eastern Europe not specified according to region
including hoards from Southern Caucasus, part of the Caliphate

tsc (total source critical comment) # probably more coins but not recorded
c estimated number ## probably many more coins but not recorded

Western Europe – Continent

T.p.q.	Hoard	Country	Total	Tsc	Dirham	Reference
793	Ilanz	Switzerland	133		2	Mc Cormick 2001:825; Ilisch 2005
795	Biebrich	Germany	4000	c	1	Mc Cormick 2001:817–18
799/800	Steckborn	Switzerland	30	#	29	Mc Cormick 2001:831–2; Ilisch 2005
850	Westerklief I	Netherlands	81		1	Besteman 1999, 2002
867	Muizen	Belgium	73		1	Mc Cormick 2001:827
875	Westerklief II	Netherlands	134		95	Besteman 2002, 2004a

Western Europe – British Isles

T.p.q.	Hoard	Country	Total	Tsc	Dirham	Reference
872	Croydon	England	250	c	3	Mc Cormick 2001:820

Northern Europe – Southern Scandinavia

T.p.q.	Hoard	Country	Total	Tsc	Dirham	Reference
? (780s)	Ribe	Denmark	?	0	?	Feveile and Jensen 2000:24, note 10
808–809	Østerhalne Enge	Denmark	8	0	8	Heijne 2004:no. 8.41; Rispling 2001:no. 12
846–847	Sønder Kirkeby	Denmark	97	0	97	Heijne 2004:no. 6.6; Rispling 2001:no. 51
867	Busdorf I/Hedeby	Germany	7	0	4	Wiechmann 1996:no. 4
852	Hoen	Norway	20	9	1	Rispling 2001:no. 52; Skaare 1976:no. 33
873–877	Rantrum	Germany	13	0	13	Rispling 2001:no. 93; Wiechmann 1996:no. 33

Northern Europe – Western Scandinavia

T.p.q.	Hoard	Country	Total	Tsc	Dirham	Reference
862–863	Torgård	Norway	7		7	Skaare 1976:no. 142; Khazaei 2001:no. 50; Rispling 2001:no. 68

Northern Europe – Eastern Scandinavia – Swedish Mainland

T.p.q.	Hoard	Country	Total	Tsc	Dirham	Reference
810–811	Birka 1991 (small)	Sweden	5		5	Rispling 2004a, no. 44–8
832–833	Wäsby	Sweden	468		468	Rispling 2001:no. 32; Zachrisson 1998:no. 26; Jonsson in. prep:no. 1527; unpubl. report NFG
850–851	Kettilstorp-Storegården	Sweden	38		30	Rispling 2001:no. 53; Jonsson, in prep.:no. 1703

T.p.q.	Hoard	Country	Total	Tsc	Dirham	Reference
856–857	Helgö	Sweden	23		23	Zachrisson 1998:no. 16; Rispling 2001:no. 61; Jonsson, in prep.:no. 1501;
857–858	Häcklinge	Sweden	408		408	Zachrisson 1998:no. 62; Rispling 2001:no. 59; Jonsson, in prep.:no. 861
862–864	Hällestad parish	Sweden	50		50	Rispling 2001:no. 69; Jonsson, in prep.:no. 1750
864–865	Äskedal	Sweden	2049		2046	Rispling 2001:no. 71; Jonsson, in prep.:no. 1117
865–866	Långhalsen	Sweden	244		243	Rispling 2001:no. 72; Jonsson, in prep.:no. 1184
866–867	Fittja	Sweden	136		133	Zachrisson 1998:no. 20; Rispling 2001:no. 74; Jonsson, in prep.:no. 1511; pers. comm., Rispling
867–868	Broby	Sweden	82		82	Rispling 2001:no. 77; Jonsson, in prep.:no. 1129
892–893	Översävja	Sweden	157		157	Zachrisson 1998:no. 14; Rispling 2001:no. 106; Jonsson, in prep.:no. 1477

Northern Europe – Eastern Scandinavia – Baltic Islands – Öland

T.p.q.	Hoard	Country	Total	Tsc	Dirham	Reference
863–864	Södra Gärdslösa	Sweden	34		34	Brather 1997:no. 110; Jonsson, in prep.:no. 1811
881–882	Algutsrum	Sweden	13		13	Jonsson, in prep.:no. 1773; Rispling 2001:no. 100
894–895	Skarpa Alby	Sweden	2022		2022	Jonsson, in prep.:no. 1914; Rispling 2001:no. 108

Northern Europe – Eastern Scandinavia – Baltic Islands – Gotland

T.p.q.	Hoard	Country	Total	Tsc	Dirham	Reference
796–797	Hässelby	Sweden	3		3	CNS 1.3.3; Jonsson, in prep.:no. 204; Stenberger 1947:no. 90
804–805	Hammars	Sweden	8		8	CNS 1.4.6; Jonsson, in prep.:no. 297; Rispling 2001:no. 7; Stenberger 1947:no. 175; pers. comm., Rispling
812–813	Ockes I	Sweden	11		11	Jonsson, in prep.:no.837; Rispling 2001:no. 16; Stenberger 1947:no. 608
816–817	Visby (outside)	Sweden	21		16	Jonsson 1993, in prep.:no. 679,5; Rispling 2001:no. 24
818–819	Norrgårda-Norrbys I	Sweden	27		23	CNS 1.2.9; Jonsson, in prep.:no. 74; Rispling 2001:no. 27; Stenberger 1947:no. 38
824–825	Hejde-Prästgården	Sweden	67		63	Jonsson, in prep.:no. 389; Rispling 2001:no. 30; Stenberger 1947:no. 265, 267
833	Norrgårda-Norrbys II	Sweden	62		62	CNS 1.2.10; Jonsson, in prep.:no. 75; Rispling 2001:no. 28; Stenberger 1947:no. 39; pers. comm., Rispling
834–842	Stora Tollby II	Sweden	155		140	Jonsson, in prep.:no. 274; Rispling 2001:no.37; unpubl. report NFG; pers. comm., Rispling
834–835	Sandgårde	Sweden	12		12	Jonsson, in prep.:no. 565; Rispling 2001:no. 33
835	Norrkvie I	Sweden	30		30	Jonsson, in prep.:no. 321; Rispling 2001:no. 35
840–841	Ocksarve I	Sweden	437		409	Jonsson, in prep.:no. 429; Rispling 2001:no. 44; Stenberger 1947:no. 291
842–843	Norrgårda-Jakobssons	Sweden	59		59	CNS 1.2.8; Jonsson, in prep.:no. 72; Rispling 2001:no. 50; Stenberger 1947:no. 37
856–857	Svenskens	Sweden	277		277	CNS 1.3.19; Jonsson, in prep.:no. 236; Rispling 2001:no. 58; Stenberger 1947:no. 113

T.p.q.	Hoard	Country	Total	Tsc	Dirham	Reference
859–860	Runne	Sweden	894		894	Jonsson, in prep.:no. 563; Rispling 2001:no. 62; Stenberger 1947:no. 457
866–867	Lilla Vägome	Sweden	233		233	Jonsson, in prep.:no. 497; Rispling 2001:no.75; Stenberger 1947:no. 376
867	Häffinds	Sweden	13		13	Jonsson, in prep.:no. 185,5; Rispling 2001:no.78
867	Spillings III	Sweden	5100	c	5100	Jonsson, in prep.:no. 535,1; Rispling 2001:no.81; pers. comm., Rispling
867	Ajmunds	Sweden	16		16	Jonsson, in prep.:no. 507; Rispling 2001:no.76
868	Alskute (Hallbåter)	Sweden	132		132	Jonsson, in prep.:no. 454; Rispling 2001:no. 85; Stenberger 1947:no. 324; pers. comm., Rispling
869–870	Östris	Sweden	494	#	494	CNS 1.1.13,15; Jonsson, in prep.:no. 63; Rispling 2001:no. 86; Stenberger 1947:no. 18
870–871	Hemmor	Sweden	316		316	Jonsson, in prep.:no. 518; Rispling 2001:no.88; Stenberger 1947:no. 391
870–871	Spillings IV	Sweden	9100	c	9100	Jonsson, in prep.:no. 535,2; Rispling 2001:no. 82
872–873	Vikare	Sweden	129		129	Jonsson, in prep.:no. 670; Rispling 2001:no. 91; Stenberger 1947:no. 565
874–875	Spillings II	Sweden	394		394	Jonsson, in prep.:no. 534; Rispling 2001:no. 94; Stenberger 1947:no. 410
876–877	Bölske	Sweden	178	#	178	CNS 1.3.7; Jonsson, in prep.:no. 208; Rispling 2001:no. 96; Stenberger 1947:no. 96; pers. comm., Rispling
876–877	Kysings	Sweden	119		119	Jonsson, in prep.:no. 652; Rispling 2001:no. 97; Stenberger 1947:no. 552
880–881	Dals	Sweden	47		47	Jonsson, in prep.:no. 314; Rispling 2001:no. 99; Stenberger 1947:no. 208
881–882	Slite	Sweden	12		11	Jonsson, in prep.:no. 531; Rispling 2001:no. 98; pers. comm., Rispling
883–884	Kinner	Sweden	301		301	Jonsson, in prep.:no. 481; Rispling 2001:no. 102; Stenberger 1947:no. 346
885–886	Sojvide	Sweden	130		130	CNS 1.3.30; Jonsson, in prep.:no. 244; Rispling 2001:no. 103
887–888	Hägvide	Sweden	25		25	Jonsson, in prep.:no. 491; Rispling 2001:no. 104
890–891	Larsarve	Sweden	567		567	Jonsson, in prep.:no. 538; Rispling 2001:no. 105; Stenberger 1947:no. 421, 422
896–897	Lingsarve	Sweden	244		244	Jonsson, in prep.:no. 523; Rispling 2001:no. 110; Stenberger 1947:no. 403

Northern Europe – Eastern Scandinavia – Baltic Islands – Åland

T.p.q.	Hoard	Country	Total	Tsc	Dirham	Reference
835–836	Svedjelandet	Finland	107		107	Rispling 2001:no. 40; Talvio 2002:no. 104
857–858	Hammarudda	Finland	180		179	Rispling 2001:no. 60; Talvio 2002:no. 106
875–876	Bertby	Finland	882		882	Rispling 2001:no. 95; Talvio 2002:no. 108

Finland – Finnish Mainland

T.p.q.	Hoard	Country	Total	Tsc	Dirham	Reference
837–838	Housulanmäki	Finland	20		20	Rispling 2001:no. 42; Talvio 2002:no. 145

Central Eastern Europe

T.p.q.	Hoard	Country	Total	Tsc	Dirham	Reference
805–806	Răducăneni-Iaşi	Romania	7		7	Teodor 1980
882–883	Czechów	Poland	766		766	Brather 1997:no. 19; Bartzcak 1997:no. 27; Rispling 2001:no. 101
893–894	Drohiczyn	Poland	308		308	Brather 1997:no. 21; Bartczak 1997:no. 28; Rispling 2001:no. 87

Central Europe – Southern Baltic Shore

T.p.q.	Hoard	Country	Total	Tsc	Dirham	Reference
798 ?	Penzlin	Germany	4	#	4	Bartczak 1997:no. 1; Brather 1997:no. 1; Kiersnowski 1964:no. 132
802–803	Prerow-Darss	Germany	72		70	Bartczak 1997:no. 2; Brather 1997:no. 5; Kiersnowski 1964:no. 143
808–809	Kretomino	Poland	18		18	Bartczak 1997:no. 9; Brather 1997:no. 4
811–812	Stegna	Poland	17		17	Bartczak 1997:no. 14; Brather 1997:no. 3
811–812	Zalewo	Poland	40		40	Bartczak 1997:no. 15; Bogucki, in prep.:no. 23; Brather 1997:no. 2
813 ?	Długobór	Poland	3	#	3	Bartczak 1997:no. 17; Bogucki, in prep.:no. 5; Brather 1997:no. 6
813–814	Krasnołąka	Poland	10		10	Bartczak 1997:no. 18; Bogucki, in prep.:no. 8; Brather 1997:no. 7
815–816	Grzybowo	Poland	18	#	17	Bartczak 1997:no. 10; Brather 1997:no. 8
815–816	Bergen/Rugard	Germany	12		12	Bartczak 1997:no. 3; Brather 1997:no. 9; Kiersnowski 1964:no. 155
815–816	Braniewo	Poland	47	#	47	Bartczak 1997:no. 12; Bogucki, in prep.:no. 3; Brather 1997:no. 10
817–818	Mokajmy-Sójki	Poland	124		124	Bartczak 1997:no. 13; Brather 1997:no. 11
818–819	Neubrandenburg (vicinity)	Germany	7		7	Bartczak 1997:no. 4; Kiersnowski 1964:no. 119
828–829	Ramsowo	Poland	336		336	Bartczak 1997:no. 19; Bogucki, in prep.:no. 16; Brather 1997:no. 13
841–842	Ralswiek	Germany	2211		2211	Bartczak 1997:no. 23; Brather 1997:no. 14; Herrmann 1997; Rispling 2001:no. 49
850–855	Wieschendorf	Germany	156		156	Bartczak 1997:no. 26; Brather 1997:no. 20; Rispling 2001:no. 56; pers. comm., Rispling
853–854	Pirciupiai	Lithuania	6	#	6	Brather 1997:no. 392; Rispling 2001:no. 57
862–863	Pinnow	Germany	251		251	Bartczak 1997:no. 24; Brather 1997:no. 16; Rispling 2001:no. 67
867	Karnice	Poland	143		143	Bartczak 1997:no. 25; Brather 1997:no. 18; Rispling 2001:no. 79

Eastern Europe

T.p.q.	Hoard	Country	Total	Tsc	Dirham	Reference
784 ?	Glazov	Russia	3	#	3	Brather 1997:no. 343
786–787	Staraia Ladoga	Russia	31		31	Brather 1997:no. 344; Noonan 1981:no. 2; Rispling 2001:no. 3
792–793	Ungeni	Latvia	2	#	2	Brather 1997:no. 345
795 ?	Novye Mliny (Paristovka)	Ukraine	800	c	800	Brather 1997:no. 346; Noonan 1981:no. 3

T.p.q.	Hoard	Country	Total	Tsc	Dirham	Reference
797 ?	Pokot’	Belorussia	5		5	Brather 1997:no. 347
799–807	Tsimliansk	Russia	48		48	Brather 1997:no. 351; Noonan 1981:no. 4
803–804	Peterhof	Russia	83		83	Brather 1997:no. 348; Rispling 2001:no. 9
804–804	Svetlograd (Petrovskoe)	Russia	34	#	34	Brather 1997:no. 349; Noonan 1980:no. 12
805–806	Kholopii Gorodok	Russia	24		24	Brather 1997:no. 358
805–806	Krivianskaia stanitsa	Russia	82		82	Brather 1997:no. 350; Noonan 1981:no. 6
807–808	Vylegi	Russia	7	#	7	Brather 1997:no. 353; Noonan 1981:no. 8
808–809	Kniashchino	Russia	400	c	400	Brather 1997:no. 354; Noonan 1981:no. 9
809–810	Zavalishino	Belorussia	52		51	Brather 1997:no. 355; Noonan 1981:no. 10
810–811	Semenov Gorodok	Russia	16		16	Brather 1997:no. 357; Noonan 1981:no. 12
810–811	Khitrovka	Russia	12	#	12	Brather 1997:no. 356; Noonan 1981:no. 11
811–812	Nizhnie Novoselki	Russia	124	#	124	Brather 1997:no. 359; Noonan 1981:no. 13
812–813	Kremlevskoe	Russia	190	c	190	Brather 1997:no. 360; Noonan 1981:no. 15
812–813	Nizhniaia Syrovatka	Ukraine	206		206	Brather 362; Noonan 1981:no. 14
812–813	Ugodichi	Russia	148		148	Brather 361; Noonan 1981:no. 16
814–815	Orsha?	Belorussia	1700	#	1700	Brather 364; Noonan 1981:no. 17
814–815	Sarskoe gorodishche	Russia	11		11	Brather 363; Noonan 1981:no. 18
815–816	Nabatovo	Russia	2	#	2	Brather 366; Noonan 1981:no. 20
815–816	Minsk province	Belorussia	350	#	350	Brather 365; Noonan 1981:no. 19
816–817	Lapotkovo	Russia	62	#	62	Brather 1997:no. 367; Noonan 1981:no. 21
817 ?	Borki	Russia	120		120	Brather 1997:no. 368; Noonan 1981:no. 22
818–819	Novotroiskoe	Ukraine	10		10	Brather 1997:no. 369; Noonan 1981:no. 23
820/29?	Sarskoe gorodishche	Russia	60	#	60	Brather 1997:no. 390; Noonan 1981:no. 31
820–821	Iarylovichi	Ukraine	285		285	Brather 1997:no. 370; Noonan 1981:no. 25
820–821	Elmed	Russia	147		147	Brather 1997:no. 371; Noonan 1981:no. 26
823–824	Litvinovichi	Belorussia	100	#	100	Brather 1997:no. 372; Noonan 1981:no. 28
824–825	Demiansk	Russia	35		35	Brather 1997:no. 373; Noonan 1981:no. 30
828–833	Uglich	Russia	1114		1114	Brather 1997:no. 374; Noonan 1981:no. 32
831–832	Zagorod’ e	Russia	15	#	15	Brather 1997:no. 375; Noonan 1981:no. 33
835	Viatka	Russia	6		6	Brather 1997:no. 379; Noonan 1981:no. 35
837–838	Kohtla	Estonia	481		481	Brather 1997:no. 378; Rispling 2001:no. 39
837–838	Kislaia	Russia	670		669	Brather 1997:no. 377; Noonan 1981:no. 34; Rispling 2001:no. 38
837–838	Devitsa	Russia	323	#	323	Brather 1997:no. 376; Noonan 1981:no. 36; Rispling 2001:no. 41
841–842	Dobrino	Belorussia	527		527	Brather 1997:no. 382; Noonan 1981:no. 38; Rispling 2001:no. 46
841–842	Protasovo	Russia	200	##	200	Brather 1997:no. 383; Noonan 1981:no. 37
841–842	Vyzhigsha	Russia	1278		1278	Brather 1997:no. 380; Rispling 2001:no. 48
841–842	Lesogurt	Russia	137		137	Brather 1997:no. 381; Noonan 1981:no. 39; Rispling 2001:no. 47
843–844	Iagoshury	Russia	1500	c	1500	Brather 1997:no. 384; Noonan 1981:no. 40
845–846	Simony	Belorussia	125	#	125	Brather 1997:no. 385; Noonan 1981:no. 41
846–847	Staraja Ladoga	Russia	23		23	Brather 1997:no. 386; Noonan 1981:no. 42
847–848	Pskov	Russia	3	#	3	Brather 1997:no. 387; Noonan 1981:no. 73
851 ?	Kunakovo	Russia	2	#	2	Brather 1997:no. 388; Noonan 1981:no. 43
852–853	Akhremtsy	Belorussia	24		24	Brather 1997:no. 389; Noonan 1981:no. 44
860 ?	Gruchino	Russia	3	#	3	Brather 1997:no. 393; Noonan 1981:no. 46
861–862	Lake Peipus	Estonia	60		60	Brather 1997:no. 394; Rispling 2001:no. 64
862 ?	Lucesy	Belorussia	2	#	2	Brather 1997:no. 396; Noonan 1981:no. 48
862 ?	Baevo	Belorussia	2000	#	2000	Brather 1997:no. 395; Noonan 1981:no. 47
863 ?	Libagi	Lithuania	57		57	Brather 1997:no. 397; Rispling 2001:no. 70
863 ?	Pankino	Russia	26		26	Brather 1997:no. 398; Noonan 1981:no. 50

T.p.q.	Hoard	Country	Total	Tsc	Dirham	Reference
864–865	Novgorod (Kirillovskii monastery)	Russia	203		203	Brather 1997:no. 400; Noonan 1981:no. 51
864–865	Rostovets (vicinity)	Russia	9		9	Brather 1997:no. 401; Noonan 1981:no. 49
864–865	Bol' shoe Timerevo	Russia	2751		2751	Brather 1997:no. 399; Noonan 1981:no. 53
865–866	Poterpel' tsy	Russia	60		60	Brather 1997:no. 402; Noonan 1981:no. 54
865–866	Moskva city	Russia	7		7	Brather 1997:no. 403; Noonan 1981:no. 52
866 ?	Vitebsk province	Belorussia	10000	##	10000	Brather 1997:no. 404; Noonan 1981:no. 56
866	Supruty	Russia	19		19	Brather 1997:no. 405; Noonan 1981:no. 55
867	Sunzinskaia stanitsa	Russia	200		200	Brather 1997:no. 406
867	Porech' e	Belorussia	45		45	Brather 1997:no. 391; Noonan 1981:no. 45; Rispling 2001:no. 80
867	Toropets	Russia	73		73	Brather 1997:no. 407; Noonan 1981:no. 58
867 ?	Borki	Russia	50	c	50	Brather 1997:no. 408; Noonan 1981:no. 57
868 ?	Moiseevo	Russia	30	c	30	Brather 1997:no. 410; Noonan 1981:no. 60
868	Mishnevo	Russia	101		101	Brather 1997:no. 409; Noonan 1981:no. 59
869 ?	Chersones	Ukraine	82	?	82	Brather 1997:no. 412; Noonan 1981:62
869–870	Kuznetskoe	Russia	162		162	Brather 1997:no. 411; Noonan 1981:no. 61
869 ?	Ostrogi	Russia	9	#	9	Brather 1997:no. 413; Noonan 1981:no. 63
870–871	Shumilovo	Russia	1326		1326	Brather 1997:no. 414; Noonan 1981:no. 64
872–873	Khitrovka	Russia	1007		1007	Brather 1997:no. 416; Noonan 1981:no. 65
875 ?	Borki	Russia	100	c	100	Brather 1997:no. 417; Noonan 1981:no. 66
875–876	Pogrebnoe ravine	Russia	295		295	Brather 1997:no. 418; Noonan 1981:no. 67
875–876	Bobyli	Russia	346		346	Brather 1997:no. 419; Noonan 1981:no. 68
877–878	Zheleznitsa	Russia	272	?	272	Brather 1997:no. 420; Noonan 1981:no. 69
882–883	Poltava	Ukraine	100		100	Brather 1997:no. 421; Noonan 1981:no. 70
893	Novaia Lazarevka	Ukraine	76		76	Brather 1997:no. 423; Noonan 1981:no. 71

Caucasus

T.p.q.	Hoard	Country	Total	Tsc	Dirham	Reference
771–772	Ganja (Kirovabad)	Azerbajdzan	187		187	Brather 1997:no. 535; Noonan 1980:no. 4
778–779	Gora Bachtrioni	Georgia	13		13	Brather 1997:no. 536
782–783	Kariagino	Azerbajdzan	93		93	Brather 1997:no. 538; Noonan 1980:no. 5
786–787	Tauz	Azerbajdzan	10		10	Brather 1997:no. 541; Noonan 1980:no. 6
786–787	Verkhnii Adiaman	Armenia	10		10	Brather 1997:no. 540; Noonan 1980:no. 10
787 –788	Sepnekeran	Azerbajdzan	22	# #	22	Brather 1997:no. 542; Noonan 1980:no. 15
792–793	Savane	Georgia	68		68	Brather 1997:no. 543
803–804	Agdam	Azerbajdzan	60		60	Brather 1997:no. 544; Noonan 1980:no. 7
803–804	Karchag	Russia	19		19	Brather 1997:no. 545; Noonan 1980:no. 2
804–805	Agdam	Azerbajdzan	79		79	Brather 1997:no. 546; Noonan 1980:no. 9
807–808	Pshaveli	Georgia	127		127	Brather 1997:no. 547; Noonan 1980:no. 8
810–813	Stisdzir	Georgia	610		610	Brather 1997:no. 549
811–812	Arkhava (vicinity)	Turkey	300	c	300	Brather 1997:no. 548; Noonan 1980:no. 3
819–820	Mtisdziri	Georgia	305		305	Brather 1997:no. 550
822–823	Bash-garni	Armenia	55		55	Brather 1997:no. 551
828–829	Leliani	Georgia	167		167	Brather 1997:no. 552
829–830	Barda	Azerbajdzan	52		52	Brather 1997:no. 553
833–834	Dlivi	Georgia	33		33	Brather 1997:no. 555
833–834	Nerk'in Getashen	Armenia	40		40	Brather 1997:no. 556
833–834	Apeni	Georgia	394		394	Brather 1997:no. 554
850–851	Martuni	Armenia	86		86	Brather 1997:no. 557
861 ?	Chikaani	Georgia	690	c	690	Brather 1997:no. 559
892–902	Piccovani	Georgia	118		690	Brather 1997:no. 560

Wholeness and Holiness: Counting, Weighing and Valuing Silver in the Early Viking Period

8

CHRISTOPH KILGER

This chapter examines the use of silver as a medium of payment in the Early Viking Period. Kaupang has yielded comprehensive evidence of craft activity and long-distance trade crossing economic, political and ethnic boundaries. The working hypothesis of this chapter is that exchange across such borders was undertaken outside a socially binding "sphere", a situation that was made possible by the existence of different forms of market trade. It is argued that there had existed standardised media of value, or "cash/money" in Kaupang, which made calculations and payment for goods possible. Such were the circumstances from when Kaupang was founded at the beginning of the 9th century to the abandonment of the town sometime in the middle of the 10th.

The use of "money" at Kaupang is approached from two angles. For "money" to be acceptable as an item of value depends on the one hand upon unshakable reference points that are rooted in an imaginary conceptual world. The value of "money" was guaranteed in terms of inalienable possessions which stabilized and at the same time initiated exchange relationships. On the other hand, money as a medium of exchange relates to a scale of calculation which legitimates and defines its exchange-value. This scale makes it possible to compare goods and put a price upon them. In this study, it is argued that in the Viking Period there were three different principles of value and payment that were materially embodied in the outer form and weight of the silver object. These were coins, rings/ingots, and fragmented silver respectively. Both coins and rings/ingots were used and valued as complete objects. The wholeness of the object was essential for the concepts of value to exist. The meaning of the coin as an object of value was rooted in a world of Antique-Christian concepts, and its status as a unit of reckoning was guaranteed through seedcorn calculation. The value of the rings and ingots was rooted in the concept of the god Odin's eternal and stable gold ring, and their character as calculable objects guaranteed through *aurar*-calculation: i.e. a given number of coins per eyrir (Norw.: *øre;* "ounce"). Hacksilver, by contrast, has no body, and its meaning as a form of currency was indissolubly dependent upon the use of standardized weights which sanctioned the economic value of this amorphous silver. The status of hacksilver as a calculable substance of value was guaranteed through ertog-calculation.

It is argued here that *aurar*-objects were the fundamental media of payment and valuation at Kaupang. Coins were not accepted as items of value because they referred to Christian values and ideas which held sway in the monetized Frankish realm. Coins were used simply as units of reckoning that made *aurar*-objects calculable. The transition all over Scandinavia to an economy based upon hacksilver in the 10th century is described in this chapter as a revolutionary process that brought into question the existing conventions of value that were based upon the concept of the eyrir and upon objects which preserved their bodily wholeness. The use of hacksilver apparently obtained a foothold at Kaupang as early as the 9th century. When the use of standardized weights and the practice of fragmentation was accepted in the 10th century, outside of the boundaries of the town as well, Kaupang's position as an *aurar*-site and the central trading place in Viken was challenged, which contributed to the demise of the town.

8.1 Introduction

When Ohthere from Hålogaland tied up at the wharves of Kaupang in Skiringssal and disembarked, his voyage there had been a long one. Of all the Northmen, Ohthere lived furthest north. He had sailed, without a stop, from his harbour in the vicinity of modern Tromsø southwards along the coast of Norway all the way to Skiringssal. There he intended to make a short stay in order to rest before continuing across Viken down to the town of Hedeby. From the account he gave, this was probably not the first time that he had made this voyage and visited Kaupang. The presentation of the distances and the stages, geographical and topographical descriptions of the areas of land he was passing, and the account of the wind conditions and the anchorages, show that he had along experience of the sea and the sailing routes he was recording. We also know from his earlier account of an expedition into the White Sea that he was engaged in exchange trade involving pelts and walrus ivory. As the powerful chieftain in Hålogaland he was, Ohthere collected the tax from the Saami. This tax was paid in hides, whalebone, down, furs, leather clothing and leather ropes in fixed and specific quantities (Lund 1983:20–4). His travelogue is found interpolated into one of the standard reference works of Early-medieval geography, the world history of the Spaniard Paulus Orosius from the 5th century which was translated into an Old English version at the court of King Alfred the Great of Wessex in the 890s (Lund 1983:7–10).

The text does not say whether or not Ohthere engaged in any exchange trade in Kaupang or Hedeby, or whether he was able to find a market for his sought-after wares from the north of Norway. For the English compiler who added Ohthere's account to the text of Orosius, that was of no great interest. One obvious aim was to fill a gap with geographical information on a region that was not discussed in Orosius' original text. It was a matter of real importance to have information on the land of the Northmen since only a few years before Scandinavians had been attacking all around England and they were now settled there in large numbers (Sindbæk 2005: 16–17). Ohthere's travelogue unfortunately gives no information on how he traded his goods, and what customs and conventions were in force in the sites he visited.

That Kaupang in Skiringssal was not only an important resting place and anchorage on the sea-route leading to and from the end of the known world, but also an important exchange and production site, is not stated in any written source. The significance of Kaupang becomes evident when we look at the archaeological remains (Skre 2007b:22). Right across the settlement area, large quantities of silver were used in dealing. Through the most recent investigations there, it has been possible to reveal a large accumulation of coins, weights and hacksilver. What we find at this site is evidence of exchange activity in the form of silver and weights: namely the medium of payment and the appropriate equipment; but rarely do we find the goods themselves that were the objects of trade. Any organic material has long since disappeared. On a few plots we also have clear evidence of metalcasting, in the form of crucibles, moulds and lumps of melted lead (Pilø 2007d:207–8; Pedersen, in prep.). Traces of silver and gold metal in crucibles show that precious-metalworking was practised (Pedersen, in prep.). A lump of semi-melted dirhams may reveal that coins were melted down in order to make larger units such as the silver ingots of standardized weight (Blackburn, this vol. Ch. 3.1.2, Fig. 3.1). The archaeological finds from Kaupang thus reveal a considerable variety of ways of using silver. The aim of the present chapter is to study the multi-faceted exchange relationships of the Early Viking Period that made use of silver and of which evidence is found at Kaupang.

The northern route, and three different concepts of silver as currency

The route from Northern Norway to Hedeby was also a journey across the wide spectrum of practices in respect of payment and standards of value that we know of in the Viking and early post-Viking Periods. If we look more closely at the Early Viking-period silver finds from along Ohthere's route, several clear regional differences emerge. In Northern Norway and all the way down the coast of Norway to Kaupang there is a large number of silver hoards. As a rule, these do not contain coins, but usually ring-jewellery, normally neckrings (Hårdh 1996:47–8 and 192–6). But there are also hoards consisting primarily of armrings (e.g. Grieg 1929:nos. 15 and 92; Sheehan 1998:177–8; Spangen 2005:nos. 16, 18 and 20). The Norwegian neckrings are amongst the largest that were made in Scandinavia (Hårdh 1996:fig. 16). Both the neckrings and the armrings seem to have been standardized in both form and weight (Hårdh 1996: 60–1 and 64–5; Sheehan 1998:178–9; see also below, 8.4). After Kaupang, the voyage continued across the wide Vik sea-lane and then along the western coast of Sweden down to Jutland and Sjælland. These areas were of great prominence in the 10th century, for the earliest hacksilver hoards in Scandinavia appear here (Hårdh 1996:91–2, fig. 21). In contrast to the jewellery hoards, the silver objects in these hoards had been broken up into tiny fragments. This hacksilver was probably measured with the aid of standardized weighing equipment which came west with the dirhams (Steuer 1987:479–80, 2002:137–40, fig. 5). The journey then came to an end at Hedeby. Here, the traveller from the North encountered yet another way of defining value, namely in the form of coinage. Minting at Hedeby – and possibly also at Ribe –

gained pace from c. AD 825 onwards and continued with occasional interruptions to the second half of the 10th century (Malmer 2002b).

On the basis of the above sketch, I propose that there were three fundamental but distinctive ways of valuing the medium of silver along Ohthere's route:

- silver in the form of rings and ingots of standardized weight;
- silver in the form of fragmented hacksilver;
- silver in the form of coinage.

Ohthere probably had no choice but to familiarize himself with and to respect the conventions of payment and valuation that were in force at the sites he came to. Likewise all other travellers who passed along the northern way and stopped at Kaupang would have had to be familiar with these three ways of valuing silver.

Although there had been extensive contact along this route, these three modes of valuation and payment remained independent from one another for a considerable time, and appear indeed as stable practices in their own regional and local contexts. A number of hacksilver hoards begin to appear in Northern Norway only around the middle of the 10th century (Skaare 1976:173). But hoards with whole objects are found in this region as late as the end of the Viking Period (Spangen 2005:19–20). In the Early Viking Period it was only at Hedeby and possibly also at Ribe in the far south of Scandinavia that coins were in circulation as a means of payment (Malmer 2007, Wiechmann 2007). It was not before the beginning of the 11th century that minting began at other sites in Scandinavia, under royal authority at towns such as Lund and Sigtuna (Malmer 1997). In Norway, coins were introduced as a form of currency under King Harald Hardrule in the mid-11th century (Skaare 1976:68–74 and 112–13). Here it was towns such as Trondheim that were the centres of innovation in respect of the use of coinage and which constituted isolated monetized oases in relation to their hinterlands (Risvaag and Christophersen 2004). At Kaupang we have plentiful evidence of the handling of hacksilver, ingots, ring silver and silver coin, along with the use of weights in one and the same place (Blackburn, Hårdh, and Pedersen, this vol. Chs. 3, 5 and 6). Both the composition and this quantity of finds from an Early Viking-period settlement site north of the Skagerrak are as yet without parallel.

Bridging disciplinary clefts

Hacksilver, ingots and ring silver, coins and weights, have rarely been considered together in an integrated interpretative view. The divided treatment of these finds is the result of distinct disciplines in Viking Period research following different sets of questions and being based upon separate research traditions. Coins have been principally treated by numismatists and historians as quasi-textual sources (Kilger 2005). It has been first and foremost institutional mechanisms such as royal power that have stood at the centre of descriptions and explanations of the use of coins in state-organized societies. The ring, on the other hand, has been regarded by archaeologists, historians of religion, philologists, etc., as a "prehistoric" object. It is suggested that the ring as a symbol of status, power and law played an important role in a chieftain- and clan-based society in which social relationships were predominant (e.g. Steinsland 1991; Brink 1996; Spangen 2005). In this way, the ring is considered to be a symbol of the mental and social universe of the Scandinavian Iron Age, while coins are, by contrast, the expressions of a medieval and at the same time an economically motivated worldview. Coins that are found in prehistoric contexts, for instance in settlement layers or graves, are interpreted as jewellery or as pieces of precious metal. Or they indicate contact between the area of minting and the find-spot itself. Thus they are rarely regarded as value-laden objects with a monetary character (for further discussion on this topic, see Horsnæs 2005; Kilger 2005:43; Myrberg 2005:7–8). Coin-specialists have for their part rarely paid attention to the ring as a standardized object of value, despite the fact that there are many conceptual parallels between rings and coins. Many forms of ring known from the 9th century are both standardized in terms of weight and of stereotyped form and design, just like coins. Thus the regionally distinctive distribution of the spiral-twisted neckrings of the Permian and Duesminde I types in the Baltic Sea zone (Hårdh, this vol. Ch. 5.7), or of the armrings of Hiberno-Norse type in the North Sea area (Sheehan 1998), are strongly reminiscent of the geographically defined areas of circulation of coins within the Carolingian realm (Metcalf 1981). In contrast to the coins, however, it is unlikely that we can explain this by postulating a "Lord of the Rings" who was in control of the production and use of the rings within the area of his own authority (for a different view, see Skre this vol. Ch. 10:350). Weights, however, fall into a position intermediary between numismatics and archaeology. Metrological analyses have shown that the weight-standards that are embodied in the weights originated in state-organized societies (Brøgger 1921; Kyhlberg 1980b, 1986b; Sperber 1996). However we rarely find weights in these primary monetized contexts; they are found in graves, on settlements, and sometimes also in hoards in secondary non-monetized contexts.

The purpose of the present study is to try to link up the different groups of categories of artefact that we find at the settlement area, namely coins, weights, ingots and rings, through the characteristic of standardization by weight. The initial hypothesis is that they served the function of money in economic transactions. What inter-associates these categories of find is the fact that they all represent some way of handling silver. The silver had been weighed, and its quantity calculated by means of balances and weights. Objects of silver were probably broken into fragments in order to yield portions in small units or melted down for the purpose of producing larger units such as rings or ingots. Through these transformations objects of value of the desired weight, contents and form were produced. Silver as a substance was thus probably used both as *whole* objects and as fragments. The two modes of value which preserved their bodily wholeness were the coins on the one hand and the rings and ingots on the other. To break up and weigh silver in smaller *amorphous* units appears therefore to have been a different way of calculating and expressing value. In that case, the basic question is, which conventions and concepts of value governed the use of silver, either as whole silver coin and as ring silver, or as amorphous hacksilver, in the economic transactions that took place at Kaupang? This study is an attempt to build bridges across the disciplinary clefts between archaeology, numismatics and history. The aim is the show the close conceptual relationship between coins, rings and weights, and that all of these were standardized items.

8.2 Exchange, money, and value

A study such as this, the purpose of which is to discuss the economic importance of the urban settlement of Kaupang and its economic relationships with the rest of the world, and above all to clarify the use of forms of currency in the Viking Period, has to take the anthropological approach into account. Since the 1970s, an anthropological perspective has dominated our ideas of economic practices in Iron-age and medieval Scandinavia (Norseng 2000b:23–5). More than anything else, models and a set of concepts developed by the "substantivist" school of economic anthropology have been massively influential (Polanyi 1957, 1968, 1998; Dalton 1975; see also Skre this vol. Ch. 9:333–5). Over the years, substantivism has been introduced and discussed in many works of archaeological scholarship dealing with relations in the Viking Period and early Christian Middle Ages (e.g. Thurborg 1988, 1989, Christophersen 1989a, Gaimster 1991, Carelli 1998, Gustin 1999). The substantivist position has also left its mark in historical studies (e.g. Lunden 1972, Monclair 2002) and numismatics (e.g. Klackenberg 1992, Grinder-Hansen 2000, Gullbekk 2003). It can be summarized as follows.

Substantivism posits an essential difference in how economic relations are structured between primitive, i.e. aboriginal, societies and in the modern, market-oriented economy respectively. This idea has been further developed over a more extended historical range to apply also to pre-modern societies. What substantivism stands against is the formalist point of view of the classic "national economic" theories. These hold that economic structures are independent of time and always function according to the same principles irrespective of the period or the society in question. The substantivists are critical of the fundamental idea of the formalists, that economic relationships are governed in all societies by the notion of profit – the principle of "supply and demand" – and that individuals are always concerned to increase their personal profit. Substantivist theory also asserts that economic relationships in prehistoric and primitive societies must be entirely socially controlled, in contrast to the capitalist system in which those relationships are largely depersonalized. The idea that economic structures within premodern societies were interwoven with the social structure is promoted as the alternative. This situation, in which the economic is inseparably part of the social, is called "embeddedness". Substantivism also argues that in premodern socieities there was no unlimited circulation of goods which could be bought or sold as if in an open market. Economic transactions were either based upon hierarchical gift-exchange systems, in which the distribution of prestigious objects of exchange was channelled through a political centre (redistribution), or the exchange of goods took place on a horizontal plane between two parties by way of simple bartering (reciprocity). Finally, substantivism assumes the existence of a system of "spheres" of transaction in premodern society. In this system, a distinction is drawn between impersonal commodity goods and personal gifts. Commodities and gifts each circulate in their own spheres of exchange, without intersecting.

Substantivist concepts have been highly influential in many studies of economic relationships within the Iron Age and early Christian Middle Ages. The "prehistoric" economy was in all respects different from that of modern society governed by the market economy. In several studies, this prehistoric "otherness" has become the very antithesis of our modern society and values. But the substantivist perspective which has been so eagerly embraced offers a rather simplistic picture of the character of exchange of goods in primitive societies. As later anthropological research has shown, the societies of the Southern Seas have been extensively idealized by, for instance, Bronisław Malinowski (1922), who with his fieldwork at the beginning of the 20th century formulated the essential views of substantivism. Even though anthropologists like Malinowski were living among the people they were studying, the societies concerned were still represented and shaped according to the predilections of the scholars and their own intellectual frames of reference (Thomas 1991:9–14, Weiner 1992:23–8). They were turned into romanticized but at the same time polemical projections of industrialized society's and the Western world's social, environmental, and ethical decline. Behind substantivism's concept of embeddedness one can detect a belief in an un-modern goodness and innocence which has not been corrupted by the knowledge of profit. The market economy and modern society appear as a form of piratical capitalism. This takes on the role of an immoral and thus negatively charged *alter ego*.

Consequently, it is essentially the same point of view that is emphasized in the archaeological studies, whose authors seek to distance themselves from a concept of reality and plane of understanding which embody capitalist values (e.g. Johansen 1997:11–15). But this approach goes hand in hand with a particular line of argument concerning the relationship between prehistory and our own times. The "soulless" and "uncaring" market economy fulfils a necessary function as the frame of reference for our own evaluations, and for our modern, secular, world-view. It is only through this frame of reference that it is possible to perceive and understand prehistory as different. At the same time, though, one becomes locked into a dichotomous interpretative template involving the "otherness" of prehistory and the "sameness" of the present day (Moreland 2000b:1–5). Thus it is not entirely unreasonable to posit that the "other" reality that is represented in prehistory is still a reflection of our own times. Prehistory becomes a projection of the scholar's own desires.

The starting point for this study is not to return to a national economic viewpoint such as was uncritically accepted in Viking Period scholarship in the first half of the 20th century (see discussion Gustin 2001). Trading sites such as Birka were described as populated by merchants striking bargains (e.g. Schück 1926). Trade was described from a macro-perspective. It was influenced by international flows of coinage and goods between Eastern and Western Europe, and the prices of silver determined the profitability of the long-distance trade network (e.g. Bolin 1953). In this view, the economic relations of the Viking Period were very similar to those of our own times, with a market system that determined prices, commercial trade relations that were driven purely by a profit motive, and a macro-economy with international flows of currency. It is this "anachronistic" picture of the Iron Age that many oppose and seek to replace (e.g. Zachrisson 1998: 12–25; Spangen 2005:21–35). There is no doubt that Iron-age societies were different from industrialized ones. This was a social situation in which notions of social prestige were dominant, along with personal ties, a different world-view, and conceptual frames of reference that seem very strange, even terrifying to the modern mind (Price 2002:25–47). I concur with that representation. However it does not mean that Iron-age societies are unapproachable, virtually incomprehensible to the present day.

In any attempt to pick up the codes, conventions and symbolism that governed economic relations at that time, one is obliged to abandon a distanced and concurrently distancing perspective upon prehistory. An overarching objective in the study of economic relations in prehistory should, in my view, be the identification of the gaps or zones that provided opportunities for non-binding and impersonal forms of exchange. Another objective has to be to address the challenge of looking at the material media as directed and empowered, basic requirements for commodification: namely the determination of price and the comparison of goods in terms of a scale of value. The attempt to understand the phenomenon of commodification in prehistory also opens up the possibility of observing the social constellations and alignments that attempted to monopolize value and to define the concepts of value and price. This is the dimension of prehistoric "economy" I shall try to discuss in this chapter, with reference to Kaupang.

A singular world of chieftains and gifts

The highly dynamic application of substantivist theory in Scandinavian Viking Age scholarship has led to a large number of stimulating propositions but has at the same time had a great deal of influence over how the archaeological evidence is angled. Although its application in the archaeology of the Scandinavian Iron Age has led to the deconstruction of a prehistory that is similar to our own age, a concomitant has been the construction of an economic world that was "singular", or monodimensional. At the centre of this *singular* world dominated by socio-economic relationships stood an elite-controlled prestige-goods system that governed the circulation of exclusive gifts and day-to-day subsistence needs side-by-side in various spheres (e.g. Christophersen 1989: 120–8; Hedeager 1993:45–49, 64–7). Particularly over long distances in geographical terms, exchange in the Viking Period was controlled by a class of chieftains, and in the following couple of centuries by kings by means of administered exchange trade (e.g. Lindkvist 1989). The class of chieftains controlled both the production of luxury items and their redistribution via the network of exchange. Through these redistributive control mechanisms the chieftains also maintained their own social and political power (e.g. Hedeager 1992:90–1, 2001; Saunders 1995). The same conceptual model has also been applied in Scandinavian scholarship in an attempt to explain the emergence of the first medieval towns at the end of the 10th century. Towns such as Lund, Trondheim and Sigtuna were founded on royal initiative (e.g. Andrén 1985; Tesch 1989, 1990; Christophersen and Walaker Nordeide 1994). The Christian national kings channelled trade and exchange to these sites and so monopolized both access to and the consumption of the goods. With control over both prestige goods and raw materials it was possible to construct alliances or to establish new power relations. Thus those who had power simultaneously managed and governed social capital by means of which they could gather political power into their own hands (for further discussion and criticism on "substantivist" towns, see Skre this vol. Ch. 9).

Most recently, John Moreland (2000b:18–22), basing himself on English scholarship, has argued that the elite prestige-goods model over-emphasizes the exchange relationships that are based upon valuable items at the expense of the production and exchange of "simple" goods. Moreland critically points out that trade in prestige goods becomes automatically a purely aristocratic option. This model is based upon the fact that in the Anglo-Saxon Period trade is concentrated in the 7th and 8th centuries in the *wics* and later, from the 9th century, in the *burhs* that were under the eyes of the kings. The distribution and production of non-high-status goods remained apart from the exchange of prestige goods. They belonged to different spheres. The perception of prestige-goods' trade, such as it has come to be applied in medieval archaeology, however, does not in Moreland's view serve to explain the multiplicity of different forms of transaction that were found in Early-medieval England:

> I suggest here that the appropriation of the concept of ranked spheres of exchange further enhances the separation of production and exchange (and the lack of consideration given to the former) within this vision of early medieval economics. Here the fruits of agrarian production are generally held to circulate at the lowest levels of exchange, totally divorced of prestige exchange which move at the higher, and more determining levels. (Moreland 2000b:19–20).

The concept that Moreland has described as "ranked spheres of exchange" creates watertight bulkheads along a vertical axis within society. High-status goods such as swords, brooches, glass, and objects of precious metal such as rings and coins, circulated as gifts and prestige items amongst men of equal rank. Bread, cooking vessels, iron nails and more mundane objects were used and exchanged below this high-status sphere.

In the same way, I believe, an economic system divided into spheres – in the way that has been done in the archaeology of the Scandinavian Iron Age – also creates separation on a horizontal, geographical plane. In this case a division is enforced between a gift-economy in Scandinavia and a monetized economy in Christian medieval Europe. Telling is the disappearance of the growth-driving Frisian merchant in the reconstructions based on the theory of spheres, their place being taken by the gift-offering, power-hungry, and aggressive chieftains (e.g. Samson 1991). In early Viking Period archaeology the Frisians were seen as key agents who could be linked to long-distance trade and the development of urbanism in Scandinavia from the 7th century to the 9th (e.g. Arbman 1937a:13–15; Jankuhn 1956:5–39, fig. 3). This horizontal problem concerning exchange relations is highly relevant to the picture we form of the economic significance of Kaupang, and to how we are to understand the Continental contacts that are so clearly evident in the finds from Kaupang. Taken to the limit, we could ask ourselves how exchange could function at all in a Kaupang that was a meeting point between contrasting notions of value and views of life, Christian and non-Christian, or was a landing place both for Frankish-Frisian merchants who came from a monetized, state-organized society and for chieftains such as Ohthere.

Means of exchange in non-monetized contexts

What most archaeological applications of the conceptual model of economic spheres have in common is a fundamental scepticism with regard to the existence of monetary mechanisms in premodern societies. By monetary mechanisms, I mean in this case a form of neutral measure of value, standard of value, or "cash" with which one can evaluate and put a price on objects that become involved in transactions. Monetary mechanisms in the form of cash should, under such conditions, render the walls of the various spheres permeable, and thus challenge the redistributive gift-system and so the social and political order in turn. Here may lie the basic idea that everything has a price. The use of money leads irresistably to things being comparable and capable of valuation according to a single scale. In buying and selling, the personal and social ties originally attached to the objects are neutralized. This is also the reason why those works that have discussed the appearance of media of payment in prehistoric contexts have generally referred to the interpretative model comprising *special* and *all-purpose money* that has been strongly advocated by substantivism. Märit Thurborg has formulated the archaeological position in the following terms:

> Here there is a fundamental difference between all-purpose money and special money that expresses, in itself, something essential to the structure of the society and the role of the economy … Put simply, one may say that all-purpose money represents our modern society, in which, in principle, one single medium serves the exchange of goods and services and in which all such circulation is economic in character. Special money, conversely, represents a society in which there are many different media, with distinct and definite functions, and in which the economic aspect does not always play a leading role. (Thurborg 1989:89, translated)

In this way, coins, for example, that appear in Viking-period contexts are not understood as a currency in the full sense but rather described as a medium that had a primarily political and social function (e.g. Christophersen 1989:134–7; Hedeager 1993:60–2; Varenius 1994). Another example is the Viking-period lead weights that several scholars believe were not purely economic in function, and so could also have been used in other situations besides payment (Pedersen, this vol. Ch. 6.4.3). Alternatively, then, the significance of the weights in production is stressed. They were used by silversmiths to produce metal alloys (e.g. Feveile 1994:58; Gustin 1999:246–8; Graham-Campbell 2002:56). Rings are generally identified as gifts, tribute or fines, with a limited role in payment (e.g. Gaimster 1991:116–18). On the other hand, hacksilver indicates a use of silver distinctly more economic in character than the social use of ring-silver (e.g. Besteman 2002:450, 2004a:98). By stressing the social dimension of the object and thus automatically excluding economically motivated use in the widest sense of that concept, artificial lines of division are created. The understanding of means of payment such as coins, weights and hacksilver in particular, but also of the rings, has been analysed from a stereotyping perspective and related to all-embracing socio-economic institutions such as gift-craving chieftainly and kingly power, and the principles of exchange of redistribution and reciprocity.

In my judgment, this is one reason why no one has gone further in analysing the significance of the coins or "cash" in general as a form of currency. "Cash" establishes a form of continuity to monetized societies with their values and so on to market-economic mechanisms and ways of thinking. It neutralizes the social constellations that characterize the closed socio-economic cosmos of the Iron Age; it dissolves *embeddedness* and in the end encourages a positive comparison between prehistory and our own age. The presence of coins, coin-like or standardized items such as rings and weights in prehistoric contexts that may have been of significance as a means of evaluation and payment have consequently not been investigated more fully but rather described schematically as special money serving an entirely social or political role. In this chapter I shall propose an alternative line of approach to currency to that which peeps out from the functionalist division between special and all-purpose money. A fundamental premiss of my position is that it is not possible to determine that cash had either a social or an entirely economic function since neither of those can be separated from the other. Several of the key tenets of substantivism have also been modified in more recent anthropological studies.

In ceremonial and strongly ritualized exchange-systems without money or markets, it has been observed that there are nonetheless various forms of mechanism for calculation and pricing which promote the personal wealth of individuals (Appadurai 1986:18–20; Godelier 1999:85–93). Anthropological studies within traditional societies show that objects of value can assume two quite different functions both as objects of gift and as cash to pay for services or goods:

> The same type of object can take two distinct functions because it enters into two distinct fields of social relations. For, and this is a crucial point, in all of these societies, commodity exchanges and gift-exchanges exist and coexist as two modes of exchange and two areas of social practice which are *consciously* and *purposely* kept distinct and separate, even though the same type of objects circulate in the one and the other, and between the one and the other. (Godelier 1999:165).

The use of objects of value as both gifts and as cash maintains and defines the social relationships within a society. Other studies have shown that commodities exist in one form or another in all societies which engage in exchange (Kopytoff 1986). The commodification of objects is a universal phenomenon and not one restricted to the capitalist system. Where, and under what circumstances, commodification can take place varies from culture to culture. Commodification can primarily be understood as a cultural process that is accompanied by rituals which attempt to alleviate its disturbing effect. It always requires an attitude. The interpretative view I apply in this study is that objects of value that are brought into exchange are regarded as living – that they can be attributed with a complex of ideas and concepts of value. It is this conceptual capacity that influences and shapes the economic value of the object in its social and cultural context.

The exchange of values

Neither the earlier research school that interpreted prehistory from a national economic perspective nor the representation of the Scandinavian Iron Age shaped by substantivism has discussed in detail *why* objects that were involved in exchange were regarded as valuable. Prestigious gifts are described here as valuable because they were made of precious metals such as gold and silver or, in the form of jewellery, are the product of a complicated and time-consuming process of manufacture. Subsistence goods of the Viking Period, lacking prestige, such as utilitarian iron, soapstone vessels, schist whetstones and quernstones, can be marketed at a foreign market-place because they constitute scarce goods in demand there (e.g. Christophersen 1989:128). A fundamental logic behind both the market-economic model and the prestige-goods model derives from the principle of supply and demand. In these interpretations, in fact, both the profit-motivated trader and the chieftain seeking honour are remarkably alike. Trade over greater distances was generated by some material need, and the function of exchange was to redress the balance and level out a shortage or surplus of goods or social prestige. A chieftain's wealth was based upon the extent to which he could control the redistribution of prestige goods. It was in his interest to create a shortage of prestigious items which would increase his standing and at the same time underpin his power over others. The real driving force for an engagement in gift-exchange or in market-type transactions thus remains essentially unproblematic and is taken for granted. But what was the stimulus for people to engage in economic relationships?

In his work on the theory of money, *Die Philosophie des Gelds* (English trans. 1990), first published at the beginning of the 20th century, the German sociologist Georg Simmel discussed why objects that are involved in a transaction are regarded as valuable, and what is the essential nature of economic transactions. According to Simmel, value is not a *natural* endowment in itself. The value of objects is defined and redefined in negotiation between different individuals, or "subjects". But it is, at the same time, impossible to draw a categorical boundary line between the world of the subjects and that of the objects. They stand in a many-sided relationship and "infect" one another:

> In whatever empirical or transcendental sense the difference between objects and subjects is conceived, value is never a "quality" of the objects, but a judgement upon them which remains inherent in the subject. And yet, neither the deeper meaning and content of value, nor its significance for the mental life of the individual, nor the practical social events and arrangements based upon it, can be sufficiently understood by referring value to the "subject". The way to a comprehension lies in a region in which that subjectivity is only provisional and actually not very essential. (Simmel 1990:63)

The objects that are exchanged thus undergo a constant process of valuation. And even the individuals who participate in exchange are affected by the objects that are being exchanged. Objects can thus assume an active and identity-determining role simply by being exchanged. In no way are they silent or lifeless. Connotations of value develop and function in a border zone between the subject and the object. Value is thus no absolute entity that is already there and which exists purely *in itself.* Value is initially created by the subjects who participate in exchange.

Simmel also argues against the usual ideas of what constitutes value, namely that economic objects are valuable because they are difficult to obtain. Instead he completely inverts the conventional logic behind economic profit. There is a form of economic motivation found above all in what the object makes of us. Objects are considered valuable because they manage to resist our desires to own them. They become economic objects because of our desires (Simmel 1990:66–7). In order to satisfy our desires we are obliged to bridge the gap or distance between our wishes and their satisfaction through various forms of exchange. But we can only achieve satisfaction by concurrently giving up some object that is the object of someone else's desire. This sacrificial procedure is, according to Simmel, at the root of all forms of what are called economic logic. In practice, exchange involves the making explicit of the value-content of the object itself.

Simmel's view of what constitutes value can be used to understand the intrinsic motivation of exchange of economic objects. This is the case irrespective of whether one is in the capitalist present or was an agent in an Early-medieval exchange system, such as, for instance, a Frisian merchant of the 9th century. As I read Simmel, value is a relative concept, and connotations of value which determine the nature of economic relationships do not have to be universal. From Simmel's concept of value the market and gift systems do not necessarily have to stand as irreconcilable opposites in the way that substantivism asserts. If we accept that all economic relations are formed by social relationships, irrespective of time and place, during the Iron Age and equally today, and that the process of exchange itself produces and defines value, Simmels (1990:80) goes on to give the following paradoxical formulation a deeper meaning. Economy is based upon an exchange *of value* but at the same time economy deals in *an exchange* of value.

This brings us into a key interpretative issue for this chapter, namely the relationship between the sphere of value and the economic objects that were exchanged. Exchange does not represent solely an exchange of a substance or goods but also the trading of immaterial values that are associated with the objects. The motivation for Early-medieval *mercatores* such as the Frisians to set sail towards the horizon thus did not necessarily rest upon an idea that goods were cheaper along foreign shores. It thus also need not depend immediately upon the commercial value of the goods or upon a shortage of them in the homeland, but also upon a conceptual character they had which initiated exchange. The goods may have had an attraction and irresistability simply because they were produced beyond the horizon (Helms 1993:192; Moreland 2004:147–8). This motivation for engaging in long-distance trade may, *inter alia*, provide a new perspective upon the trade in Frisian cloth, *pallia fresonica,* in the North Sea zone during the Early Middle Ages which written sources refer to (Pirenne 1909; Geijer 1938, 1965).

Preconceptions about what is valuable are imputed to the objects themselves. The objects are not neutral, or metaphorically lifeless, dead. They do not stand as empty shells, but rather are filled with ideas, connotations, and narratives from earlier lives, uses and significance (e.g. Hoskins 1998). This makes it possible to regard valuable items, i.e. objects that either make exchange possible or are the objects of exchange in some form or other, as historical objects. Exchanges are therefore *crossing points,* at which the historical contents of the object become the objects of investigation and redefinition that can also go on to colour the relationship between the giver and the receiver. Exchange always involves the negotiation of values and ideas which with the object is imbued. This theoretical perspective holds above all for our comprehension of the central objects of exchange in the Viking Period: the coins, rings, ingots, hacksilver and weights that came to be used in Kaupang.

Material and non-material aspects of monetary value

Why were coins treated as of value by medieval societies? A usual answer is that the king guaranteed the value of the coin by being represented on it by his portrait and his name. The king's political and secular power were the essential prerequisites for him to be able to establish and maintain a system of payment based upon coinage (e.g. Malmer 1996; Gullbekk 2003; Kilger 2004). Another common answer is that minting gives a piece of silver a value beyond its metal contents. It was only through the impression of the coin-die that a monetary value was manifested (e.g. Malmer et al. 1991:42–3). But is this enough for us to understand why coins were used as coins, and why they were accepted as such? It is my belief that these typical answers only provide a superficial understanding of the use of coin and cannot explain how and why monetary values emerge. There is a further relevant factor: namely a mental readiness amongst coin-users to accept the value of coin. There was something in the coin itself beyond its size and purity: an idea and a concept which could persuade and reassure the coin-users that coins were objects of value.

Frans Theuws (2004) has provided an interesting point of view on how coins may be transformed into monetary objects in the Early-medieval, monetized societies of the Continent. Theuws takes as his starting point the minting of gold coins, those known as tremisses in the 7th century, in the Merovingian realm. He argues that an economic value is not based solely upon the object's material properties but also in equal measure upon those ideas and assumptions with which the object can be associated. He bases his line of argument upon the fact that the Merovingian gold coins do not name a king but only moneyers and the mint-place. Thus the coins were not immediately linked to the world of power politics. Theuws alternatively stresses the cult of saints that was found throughout the Merovingian world and which was locally rooted in the formerly Roman towns. The saints had both a religious and a decisive economic importance to the daily lives of the people. Both long-distance trade and the regional exchange of goods and services were organized during a few days at the local market which was under the protection of the saint. As the best known example Theuws cites the annual wine market at St-Denis outside Paris. It was on these market days that the coins were struck and used. It was by the presence of the saint that the value of the gold coin was sanctioned. Through their linkage with a sacred sphere, the gold tremisses became a holy principle of value in the eyes of the coin-users.

This immaterial source of strength that sanctions the value of the coins has been thoroughly discussed by the anthropologist Maurice Godelier (1999). What makes the coins valuable in the eyes of their users rests first and foremost upon a belief in a transcendent principle or power in which the value of those coins can be rooted:

> In order for a precious object to circulate as money, its "imaginary" value must be accepted and shared by the members of the societies trading with each other. A currency cannot exist, cannot circulate as "legal" tender without having "force of law". And laws are not made by individuals. A money must harbour the presence of the gods, be stamped with their symbols or with the seal of the state or the effigy of the king. Even today, on the dollar, the only money known and accepted worldwide, is printed the reference to God, the god of the Bible. (Godelier 1999:166)

According to Godelier (1999:33 and 161–7), objects of value that come to be used as forms of currency depend upon imaginary and impalpable points of reference. It is those points of reference that have the authority necessary to legitimate the value of the currency. These are found in all societies that use any sort of objects of value as media for exchange. In traditional societies this imaginary and impalpable power is made material in holy items that belong to the gods, the ancestors, or to heroes. The objects are untouchable, and for that reason are kept out of circulation. Even the most prestigious medium of currency in modern times, money, was sanctioned by an imaginary but at the same time concrete reference point. In the 19th century and at the beginning of the 20th century it was gold, kept under lock and key in the banks' vaults, that represented the lasting reference point of the monetary system. The gold reserve was the imaginary and mythical capital of industrialism and early capitalism (Godelier 1999:27–9). From its elevated but at the same time separated position, this point of reference constitutes a continuously radiating source of energy which infuses the actual media of payment with the authenticity they need. Through its perduring and untouchable position this sort of fixed reference point can be likened to an unmoving and eternal axle about which all the economic activities, relationships and concepts of a given society turn (Godelier 1999:166–9). In the same way as gold deep down in the bank vaults gave media of payment above ground in the form of coins, notes and cheques the credibility they required, so the Merovingian saint assumed the roles of a sort of imaginary capital and of the necessary point of validation. Theuws emphasizes the sacred significance in the gold-coin economy of the Merovingian realm (2004:128). The saint was perceived both as an imagined gaurantee and as a vivifying force that animated the coins in production and endowed them with a monetary power. Consequently the coins could fulfil their function as a medium of payment on market days. As holy capital, this point, principle, power or object could never itself be the object of economic reckoning and profit, and was kept out of circulation. To use an anthropological term, it was *inalienable*. The saint, in other words, was the society's *inalienable possession.*

The basic idea behind *inalienable possession* was originally developed by the anthropologist Annette B. Weiner (1992) through her fieldwork in Oceania. Weiner (1992:28–33) attacked the established understanding that is to be found within both the national economic and the substantivist theories, that economic relations in all societies rest upon the principles of reciprocity and consensus. The purpose of all forms of economic transaction ought, according to this view, to be to create political and social stability. But exchange, in Weiner's view, is not only a matter of a supply of goods being balanced between different dealers but also above a matter of power: specifically the power to determine and control the most prestigious objects for society. *Inalienable possessions* are the actual driving force behind exchanges and the relationships of power which control those exchanges. According to Weiner, inalienability is an essential quality of the material goods, and because of this essential character it is never itself negotiable. What makes a possession *inalienable* and, ultimately, exclusive is that it accumulates a history and thus, over time, presents its own, impalpable, identity. Weiner (1992:33) compares this untouchable object with treasures that are authentic in the popular view because they reflect both fictive and real genealogies, origin myths, the sacred ancestors, and the gods. It is these immaterial and transcendental ideas that form the very core of the actual exchanges. To own or pass on an inalienable, sacred object gives a person access to his or her own group's identity and self-undertanding. Thus this also provides power over others. Weiner stresses the point that there is a categorical difference between possessions that are alienable, in other words exchangeable, and inalienable possessions, which must be kept for ever.

Inalienable possessions thus fulfil an elementary function in imparting nobility and life to objects of value, which then circulate in exchange with the authenticity and originality they need. This applies not only to gifts but also to objects that have achieved the position of being of value and as being media of value in the economic sphere:

> Gift objects and valuables are caught ... between two principles: between the inalienability of sacred objects and the alienability of commercial objects. Like the former, they are inalienable, and at the same time, like the latter, alienable. This ... is because they function both as substitutes for sacred objects and as substitutes for human beings. They are both powerful objects, like the former, and wealth, like the latter. ... In reality what is present in the object, along with the owner, is the entire imaginary of society, of his society. It is all of the imaginary duplicates of the human beings to whom have been attributed ... the powers to reproduce life, to grant health and prosperity, or the opposite, to cause death, famine, the extinction of the group. (Godelier 1999:94–5).

The idea of *inalienable possessions* does not immediately appear applicable in an explanation of why money was both regarded as valuable and could be given away at the same time. Cash is thoroughly alienable, and is the most blatant material symbol of commodification, i.e. saleability. Money is really the very opposite of everything *inalienability* stands for. But it is always a material substitute or replacement for the unsaleable possessions of the society. It is in and through money that these absolute possessions are duplicated and so split. Money represents a society's own untouchable perception of value at one and the same time as it brings that into the market place.

The conversion of objects of value into money in the sense of anonymous and impersonal values and currency, however, is not an automatic matter but must rather be understood to be the result of an extended process of cultural transformation (Godelier 1999:166). Godelier draws a clear distinction between objects of value that come to be used in exchange and money. The idea behind money is formed in the context of organized exchanges of goods in quantities that exceed the scope of simple bartering. Here money fulfils an elementary function in allowing the calculation and determination of the exchange-value of the goods. The use of money, unlike the exchange of gifts, created no social debt between two parties (Godelier 1999:42–3). There are no obligations between the giver and the receiver after a deal has been done. This means that goods or services that are bought and sold are absolutely *alienable.* It is therefore only under certain preconditions that a need for money appears to fulfil requisite functions outside any socially binding sphere. We can, as a result, expect money to appear and price-determining mechanisms to be developed only in association with emergence of long-distance contacts, the exchange of large quantities of goods, specialized agents who participate in and organize this exchange, and specific sites at which the goods can be marketed. In my view, Kaupang and other Viking-period sites for long-distance trade and the exchange of goods meet all of these criteria.

The second fundamental aspect of the use of money that Theuws has taken up in his article is the social arena and the rituals that are required in order to put coins into circulation. Here again the market days of the saints served a legitimating function. On those days it was possible for the coins to cross between different spheres of transaction. The precondition was that this transgression of boundaries was accompanied by rituals and festivals such as the market days of the saints which could mask the transgressive power of the coin. Theuws compares these festivals with the *tournaments of value,* a concept that was introduced by the anthropologist Arjun Appadurai (1986:21–2). Characteristic of *tournaments of value* is that they are held at specific times of the year and at selected sites. They represent something beyond the usual, and participation gives those in power status and the opportunity to contest their positions amongst themselves. But it is not status, social position or renown that is the driving force behind these "tournaments" but rather the opportunity to influence and redefine the role of the crucial and most prestigious objects of value that are in circulation within that society. This, then, influences the whole economic system. In other words the nominal value of coins is defined and stabilized through "tournaments of value". This can only happen when the population is assembled at the market in order to trade amongst themselves. Comparable "tournaments" which defined the nominal status of the critical objects of value would also, in my view, have been found in Iron-age Scandinavia. It was at the *thing,* for example, that the nominal reckoning of the *eyrir*-unit was declared and confirmed. That was also the occasion on which the quality of the silver that was included in the *eyrir*-ring was determined. The Icelandic reckoning of rings *Baugatal* is a good example. *Baugatal* is discussed more fully below (see p. 282–3)

Theuws's interpretative approach may provide us with a framework for understanding coins as both valuable and simultaneously exchangeable objects. The monetary power of coinage was rooted in a transcendental and unattainable principle, and the exchange-value of money, its nominal function, was defined in a social area between various agents. But this does not show us how in practice coins functioned as objects of value throughout the series of transactions. The use and significance of coins remains a solemn and religious affair. In Theuws's view the gold coins belong to what he calls the *transaction of the long term,* which reproduces the cosmic and thus also the social order of society. According to John Moreland (2004:145–6) Theuws's model cannot explain *in what way* coins as the sacred objects of value of the saint communicated with other types of transaction which, for instance, made it possible to sell and pay for day-to-day commodities such as wine or grain, as are frequently documented in the historical sources, or how one could pay craftsmen or for their products at market sites or in trading places.

In order to be able to make the links between money and different types or spheres of transaction, there is one further consideration which neither Theuws or Moreland has discussed. This is the possibility that money and other objects of exchange are regarded as calculable and quantifiable: in other words that they can be compared according to a single scale. This makes it possible to examine the significance of Kaupang as a site at which exchange was practised from a monetized perspective. To illuminate this, I shall analyse the concept of "money" in the following sections of this chapter on the basis of two different questions and perspectives:

- What mechanisms allow forms of currency such as coins, rings and ingots, hacksilver, and even equipment for payment such as weights, to be calculable? Against what scale was their exchange and reckoning value defined? These questions thus involve metrological issues to a very large extent.
- What immaterial connotations of value made media of payment valuable? What *inalienable* characteristic was represented in the object in order for it to assume the authenticity necessary as money?

I have divided this chapter up according to the three ways in which silver was handled and valued during the Viking Period. In section 8.3 I analyse how coinage was sanctioned as a standard of payment and value in the Early Middle Ages of Western Europe, in areas which had direct contacts with Kaupang in the 9th century. In the same way, in section 8.4, I take a closer look at the meaning of the ring as an object of value and how *aurar*-reckoning came to be established as a standard of value in Iron-age society. In section 8.5 the connexion between the fragmentation of silver and the introduction of the standardized Oriental weight-system in the form of cubo-octahedral and spheroid weights in the second half of the 9th and at the beginning of the 10th centuries is explored.

8.3 Coins and coinage around the North Sea

Travellers who took the same route as Ohthere down the west coast of Norway to Hedeby were presumably thoroughly familiar with the use of coin. Those who visited Hedeby may have seen how the residents of that town dealt with coins along the harbour area, and in other parts of the town too.[1] Ohthere also visited the court of Alfred the Great in Wessex, England. Many Scandinavians who lived in England at the time when Ohthere's report was written down will very probably have seen how people used coins to make payments all over the kingdom. It is not impossible that people of Scandinavian origin themselves made use of coinage when they were staying there. At the end of the 9th century the Vikings initiated their own minting, following English prototypes, in the town of York in Northern England (Grierson and Blackburn 1986:316–25). But as soon as one sailed back to Scandinavia one left all of this behind. In Ohthere's own homeland it is likely that people had a quite different perception of minted silver. That coins were not accepted and used as a means of payment is implied by a variety of archaeological find-contexts.

Western European coins of the 9th century and the very early 10th are very rare in Scandinavia. The few Anglo-Saxon pennies and Carolingian deniers that are known from Norwegian finds appear almost without exception in female graves where they were used as pendants (Garipzanov 2005:47–50). The small number of Western European coins known from Early Viking-period settlement contexts are from Kaupang, amongst other sites. Altogether six 9th-century coins have been found, including three Carolingian deniers struck under Louis the Pious (814–40), two Anglo-Saxon pennies of King Cœnwulf of Wessex (796–821), and a putatively Scandinavian coin of the Wodan-Monster type, possibly struck in Ribe after c. AD 825 (Blackburn, this vol. Ch. 3.3.2, Fig. 3.17.a–c; Rispling et al., this vol. Ch. 4:Nos. 6–11). The Western European silver coins from Kaupang were struck before c. 840 and thus long before Ohthere's day. There is also the remarkable find of a Frisian gold coin, the type known as a *tremissis,* struck in Dorestad in the middle of the 7th century (Blackburn, this vol. Ch. 3.3.3, Fig. 3.18.b; Rispling et al., this vol. Ch. 4:No. 5). This gold tremissis is hitherto the only specimen of its kind in both Norway and Sweden. In comparison with the coin finds from Dorestad, one of the largest trading sites in the Frankish realm, the finds from Kaupang are distinctly meagre. A series of archaeological investigations have recovered more than 200 separately found Frankish deniers. Besides these single finds there are also three coin-hoards with a total of over a hundred coins (van Gelder 1980:222, tab. 13).[2]

From other categories of archaeological finds from Kaupang we can conclude that the contacts with the Frankish world were good. As an example we can take the sherds of pottery manufactured in the Badorf region of the Rhine Valley down to the end of the 9th century, and which was in all probability not brought to Kaupang to be traded but rather for practical personal use (Pilø, in prep.). Another category of finds that implies that individuals from the West Frankish territories had been in residence in the settlement area of Kaupang are the run-of-the-mill items and personal dress-accessories. The concentrated distribution of these objects may show that people from the Frankish realm lived in their own quarter in Kaupang (Wamers, in prep.). Sherds of Frankish glassware are another important evidence for good contacts with the Carolingian world (Gaut, in prep.).

The Franks and Frisians who discharged their cargo at Kaupang were probably quite familiar with the use of coin as a form of currency and as a generally recognized standard of value in their homelands. Had coins been adopted as cash in Kaupang they ought to have been circulated in larger quantities and presumably have left clearer traces behind them in the form of single finds in the settlement area (for a different view, see Skre this vol. Ch. 10). However, coins evidently had no monetary value, either in Kaupang or beyond the town (for a different view, see Skre this vol. Ch. 10:347–8) and the question is "why?". Why did the use of coin fail to establish itself in Kaupang as it did in the other contemporary Southern Scandinavian towns of Ribe and Hedeby? Is it a question of whether or not coins were rejected because they *themselves* were regarded as tokens of value? Or could the method of calculation and with that the scale of value that Western European coins represented, not have been accepted beyond the monetized area in which they originally were meant for use? Were people at Kaupang rejecting in this way both the concept and the notion of value that they represented?

I believe that the answer to these questions lies in understanding the monetary context that regulated the use of coin in the Carolingian Empire. In the following section I shall, therefore, take a closer look at how monetary value was legitimized and how people handled coin as a means of making payments in the monetized societies of Western Europe. By way of introduction I shall examine the character of the coin as a measure of value and a means of standardized calculation. The question I shall consider first is: why, and in what way, coins could be used in calculation.

Counting seeds and coins – an Antique and medieval way of reckoning

The ideological and conceptual ancestry of all of the monetary systems of medieval Europe, Byzantium and the Caliphate can be traced back to the Roman coinage. In order to understand the use of coins in the Carolingian realm we need to look in more detail at its structure: the theoretical rules of play and the practical conventions that governed the minting of coins and their use both in the Late Roman Empire and in its Merovingian successor. How was the weight and purity of gold coin defined?

The Emperor Constantine the Great introduced a new standard gold coin early in the 4th century with the *solidus aureus.* He reformed the Late-Roman monetary system which, since the beginning of the 3rd century, had been afflicted with continuous debasement. Alongside the solidus smaller coins such as a half-solidus, called a *semissis,* and a third of a solidus, the *tremissis* or *triens* were introduced. What made this reform so progressive in the Late Roman Empire was that its official gold coin standard was, as the word supposed, solid. Constantine's gold coin was of reliable average weight and was made of pure gold (Spufford 1988:7). It was the practice with Antique coinage that the basic coin that a monetary system rested upon could be reconstructed and adjusted precisely with the help of seeds and grains (Ridgeway 1892:181). It was known that the weight of these was constant.[3] A certain amount of gold could thus be calculated to a high degree of accuracy. Chosen as the cornerstone of the solidus system was the seed of the carob tree, which was found growing in Western Asia and the Eastern Mediterranean area. The seed of this tree was called *κεράτιον (carat)* in Greek and *siliqua* in Latin. According to Constantine's reform, a solidus of pure gold should weigh 24 carats (Grierson 1960:251–2).[4] A semissis therefore weighed 12 carats and a tremissis 8.[5]

The seed was not only the foundation stone of the Antique monetary system; at the same time it defined both the weight- and the counting-units employed in trade and exchange. The stable reference point of the Roman weight system was the gold solidus. A Roman pound *(libra)* was, after Constantine's reform, 72 solidi. Transposed into the modern metric system this corresponds to about 327 g (Witthöft 1985:402; Grierson and Blackburn 1986:14). It should be noted from the beginning that in the Ancient World and later in the Middle Ages people thought and counted using seeds and coins. Relationships of quantity were expressed in specific units which corresponded to a given number of coins. Weights and numbers of coins were thus conceptually synonymous. The metric system – using grams – that we are used to think in nowadays was only introduced in the 19th century (Sperber 1996:11–12). With the metric system the physical and mental connexion with the coins and so back to the seedcorn was broken. The grains were the smallest, indivisible building blocks, and thus were the atoms of many premodern weight and counting systems all over the world (Ridgeway 1892:169–94).

The minting of gold coins continued after the fall of the Roman Empire. In the areas under Germanic control barbarian kings from the 5th century onwards struck a number of solidi, but mostly smaller coins that corresponded to the standard of the Roman tremisses (Grierson 1991:4–5). As in Antique coinage, the principle of value applied was the grain. But the weight-standard of Frankish and Anglo-Saxon gold coins was changed at the end of the 6th century. In place of the carat or siliqua, the coin-weight was adapted to the type of seed that was used as grain in the Germanic areas, i.e. barley. The coin-weight of the new Frankish tremisses was then 20 grains.[6] This reduced the average weight of the tremissis from c. 1.5 to 1.3 g (Grierson and Blackburn 1986: 92; Grierson 1991:17). We can trace this reform in the Frankish monetary system in the gold coins themselves. In contrast to the Frankish heartlands, there was a reaction against this Germanic change to the basic coin-standard in the Romanized Provence and Southern Gaul. In towns such as Marseilles, Arles and Mâcon this change could be seen in the coins. Provençal tremisses were marked VII to show the

1 Coin hoards in Hedeby containing Scandinavian deniers of the 9th century: Wiechmann 1996:225–30, Nos. 4–5, Busdorf I–II.

2 According to Simon Coupland (1988:9–10) Enno van Gelder's survey does not provide a complete conspectus of all the coin finds from Dorestad. A considerable number of finds made in the 19th century are not included in the table.

3 Royal decrees from 13th- and 14th-century England require that the wheat grain that was used for calibration should be round, dry, and always picked from the centre of the row of grains (Ridgeway 1892:180).

4 In Latin, the carat was termed ceratonia siliqua. A Roman siliqua, in the metric system, weighed 0.189 g, giving us a solidus of 4.54 g (Grierson 1991:1). In Ethiopia carob seeds are still used as a unit of weight for calibrating gold weights. Here they are also a little heavier than the Roman siliqua weighing around 0.2 g (Thingstad 2007:40–1).

5 We must point out here that the Roman and the later Byzantine and Arabic monetary units followed a base-12 or duodecimal system (Grierson and Blackburn 1986:14). Under such a system the units were divisible by several factors such as 2, 4 and 6. This differed from the simpler vigesimal system of calculation based upon the units of 10 or 20 (Stenroth, in prep.). Both ways of counting re-appear in the Viking Period. In the earlier eyrir-system, counting was apparently done in units of 5, 10, 20, 30, 40 and so on (below, 8.4). In the late eyrir- and ertog-system counting was done with duodecimal units such as 2, 3, 4, 6, 8, 9, 12, 16, 18, 24 etc. (below, 8.5).

6 This grain (Troy grain) weighed, according to Grierson, 0.065 g. The Troy grain that is referred to as the grain-unit in the written sources is probably to be identified with the barley grain (Ridgeway 1892:180–2). William Ridgeway (1892:194) assigns a nominal weight of 0.064 g to the barley and Troy grain. The difference in weights seems minimal, but the discrepancy in the third decimal place makes a bigger difference to the size of the coins. A Frankish tremisses should in principle weigh 1.28 g, according to Ridgeway's figures (20 x 0.064 g), and a solidus 3.84 g (60 x 0.064). If we apply Grierson's figures a tremissis weighs 1.3 g and a solidus 3.9 g.

reduction of weight which meant they weighed only 7 rather than 8 siliquae (Fig. 8.1). The reduced-weight solidus was marked either XX or XXI (Grierson and Blackburn 1986:107, pl. 20; Grierson 1991:fig. 43). As I shall show in the next section, this change in the numerical value of coins in the Merovingian realms came to have major consequences for the weighing of gold and silver in Scandinavia (Kilger, this vol, Ch. 8.4). It was the lighter Merovingian tremissis that was the basic unit for the Scandinavian *eyrir*-system (Steinnes 1927:15–16).

The need for distinguishing and calculating weight according to different regional gold coin-standards can also be seen in the development of a precise-weighing tradition in Europe involving exceptionally sensitive balances. Byzantine balances in particular could discriminate at levels of a hundredth of a gram (Steuer 1987:435). Consequently it was possible to work with the weight-units that corresponded to a Roman siliqua.[7] It was particularly in the 6th and in the early 7th century that regional gold coin-standards were introduced into the Frankish and Anglo-Saxon lands as scales and balances became part of regular grave furnishings (Werner 1962). The rich grave from Gilton in Kent, England, shows that alongside sensitive balances, various kinds of weight of lead and bronze were used, plus Roman bronze coins (Fig. 8.2). This grave is dated to the first half of the 7th century (Kyhlberg 1980b:164).

Scales and weights were presumably owned by some professional coin-changer, a *nummularius.* The set of weights from Gilton makes possible a large number of combinations with which one could measure the weight of gold coins as fragments of a solidus.[8] With the help of the additive and subtractive method of weighing it was possible to calculate the number of siliquae or grains and thus the exact weight of gold in the balance-pan.[9] The extraordinary precision of balances in the Late Roman and Byzantine era is also demonstrated by metrological studies of sets of weights from Egypt.[10] Similar balance-sets as that from Gilton also appear in Norway in this period, as, for instance, in the grave finds from Bråten and Evebø (Kyhlberg 1980b:167–71). The set of weights that we have from Bråten was probably calibrated by the coin-changers themselves with the aid of gold coins whose exact weight in siliquae or grains was known.

The Frankish grain-standard was also the prototype for the massive coinage in *sceattas* that burgeoned from the late 7th century in the North Sea region. Silver sceattas were used as coins for payment on both sides of the English Channel (Grierson and Blackburn 1986:164–89). The earliest Frisian and Anglo-Saxon sceattas were very carefully weighed, and like the Merovingian gold tremisses maintained practically the exact weight of 20 grains (Grierson and Blackburn 1986:14). This may mean that in minting sceattas too, the grain itself was used to check the weight of the silver coinage in the same way as had previously been done with gold coins. Indications of this practice, namely the checking of the weight of the coins, are provided sporadically by hoards of sceattas.[11] People were highly conscious of the weight of each single silver coin, and that it was supposed to observe a precise weight-standard. But there is no direct evidence from the written sources that confirms this practice in North-Western Europe during the Merovingian and Viking Periods.

The grains were the building blocks of the Antique and Early-medieval monetary systems. The value of the coins – or rather their soul and spirit – was rooted in the type of life-producing seed that grew in the fields and was renewed each year. The gold coins also established a metaphorical relationship with the warming sun that enabled the corn to grow and ripen. Here, I believe, lies a crucial element for our understanding of coinage. The seedcorns were

Figure 8.1 *Merovingian tremissis, Mâcon, post-c. 580. 1.25 g. Size 3:1. Photo, Jonathan Jarrett, Fitzwilliam Museum, 2006.*

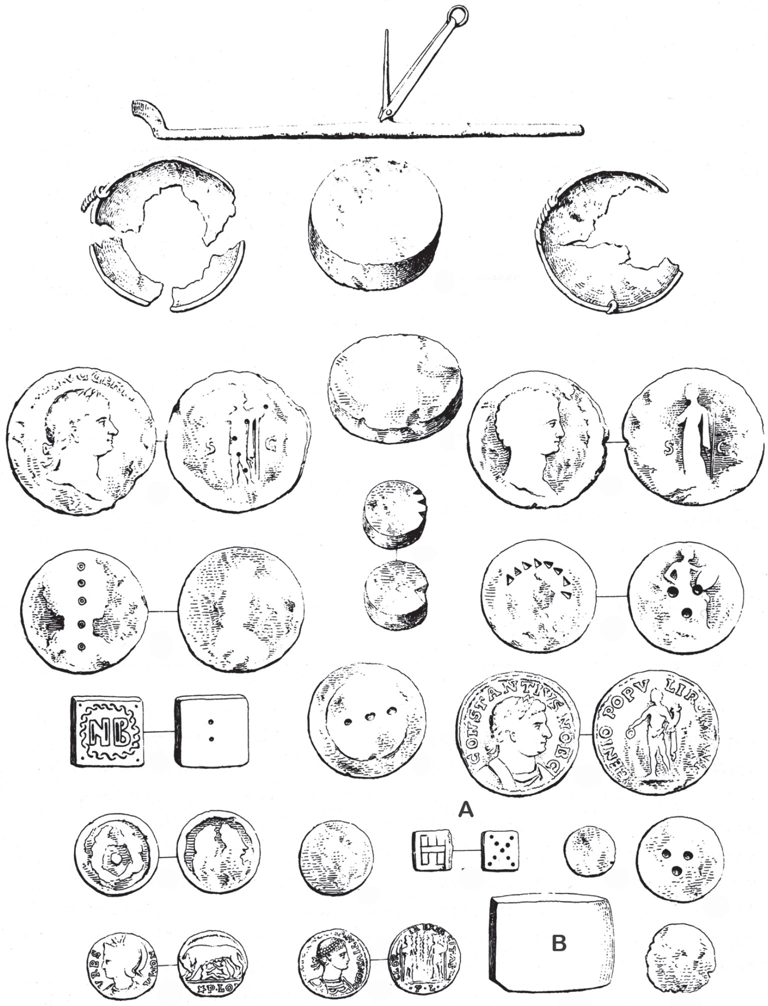


Figure 8.2 *The set of weights from Gilton, Kent, England (Kyhlberg 1980b:165).*

regarded as natural constants, as the undivisible, smallest elements – the atoms, by the monetized societies of the Antique and medieval worlds. At the same time these seedcorns were also a symbol of fertility and of the gods', later of God's, blessing, which guaranteed the continuation of human society. The aspect of calculation that resides in all use of coin was legitimated by reckoning in grains. From such a perspective, one is obliged to argue that it was through the potential of the seedcorn as the bringer of life that the populations of monetized areas sanctioned the connexion of weight with value. Specific intervals of a certain number of grains created a usable scale of reckoning, as was manifested and applied in the official gold coin standards of the Roman and Merovingian Empires. As we shall see in the next section, it was equally by means of this scale of reckoning based upon the grain that it was possible to undertake measurements and counts in day-to-day exchange relationships even in areas where gold coin was not in use.

The use of silver coins in the Frankish realm

Sometime after the middle of the 7th century, the striking of tremisses in silver began in Western Europe, and by the end of the century now very pale gold coins had been replaced by a proper silver coinage (Grierson 1991:19–28). The various types of silver coin that we refer to as denars, deniers and pennies remained the current coin over much of Europe right through to the High Middle Ages. The silver penny was the only and the fundamental coin-unit in the medieval monetized economy until the 12th century. The individuals from the Frankish realm who resided in Kaupang, apparently in the first half of the 9th century, came from a monetized society in which the Carolingian silver denier was the central element of reckoning and payment. They were undoubtedly familiar with the conventions operative within a monetary system and with the principles that defined

7 I.e. intervals of weight of 0.189 g.

8 A metrological analysis has shown that there were two different sets of weights represented in the grave, of which one was calibrated against the Roman-Byzantine solidus and the other series against the lighter Merovingian solidus (Kyhlberg 1980:164–7). The set of weights also included a touchstone (marked B on Fig. 8.2).

9 Despite corrosion and wear, the margins of error between the weights were less than 1 per cent (Kyhlberg 1980:167).

10 It has been discovered that one could calibrate the weights in relation to each other with very great precision. The margins of error between the weights corresponded to the weight of 2.4 grains, i.e. 0.156 g (Steuer 1987:435).

11 In the hoard of Frisian sceattas from Barthe, 28 coins that had been struck from the same dies, weighed between c. 18 and 21 grains (Grierson and Blackburn 1986:14). The grain-unit (Troy) corresponds to 0.065 g. This means that the coins weighed between 1.17 and 1.36 g.

the exchange-value of the denier. We shall now take a closer look at those conventions and principles, and at how silver coin was used in practice in the Carolingian realm.

Soon after the first of the Carolingian kings, Pippin III, had been crowned in AD 751, he raised the standard weight of the silver denier from 1.1 to 1.3 g. The diameter of the coin flan was increased and it became a thinner coin (Fig. 8.3, c.f. Grierson 1991:pl. 76). Pippin's decree, which was promulgated in Vernon in the year 754/5, stipulated that no more than 22 solidi should be struck from 1 *libra,* i.e. the Roman pound (Grierson and Blackburn 1986:108).[12]

Pippin's son, Charles the Great, in his great reform of measures and weights of the year 793/4, subsequently increased the weight of the denier to c. 1.7 g. The weight of the silver coins was raised without change to its nominal value. A denier was still a denier although it contained a great deal more silver than before the reform. The old Roman weight-unit of the *libra* was also superseded by the Carolingian pound.[13] The heavier new deniers struck, which were minted in every part of the Empire after the reform, are also different in respect of the design of the die, the location of Charles's monogram and the cross, and the form and position of the legends from earlier silver coins (Fig. 8.4, c.f. Grierson and Blackburn 1986:pl. 33). But what was it that stimulated the Carolingian coin-reforms, and what was the idea behind them?

Many believe it is possible to see the growing economization of the Early-medieval societies of Western Europe in the coin-reforms and the introduction of a system of payment based upon silver coin by the first Carolingian rulers. Pippin's adjustment of the weight of the coin has been interpreted as an attempt to centralize coin-production in the Frankish realm (e.g. Hodges 1982:41–2). Charlemagne's reforms have also been cited as an indication of increasing use of coin within the Carolingian Empire. Silver coin came to be used as a common way of making payments in towns and markets (e.g. Steuer 2003:162–3). Amongst other things, Charle-

Figure 8.3 *Pippin III's deniers of post-754/5. Dorestad? Size 3:1. Photo, Jonathan Jarrett, Fitzwilliam Museum, 2006.*

Figure 8.4 *Charlemagne's "denarius novus" after the reform of 793/4. Bourges. 1.76 g. Size 3:1. Photo, Jonathan Jarrett, Fitzwilliam Museum, 2006.*

magne's coin-reform has been described as a stroke of genius that virtually pushed into life an economization that went hand-in-hand with the increasing monetization of Frankish society (Hodges and Whitehouse 1983: 110). I believe, however, that these ideas are based on a far too stereotypical conceptual model which has been borrowed from substantivism namely that the use of coinage had only a limited, social function in pre-state or only embryonically state-organized societies. It was only under the centrally governed Carolingian state that coins became a fully functioning currency as all-purpose money. With the adoption of a silver coinage, then, according to this view there must have been a spread of coin-use so that coinage was no longer confined as special-purpose money to an elite, but now involved all social classes. However the coin-reform may, as I shall show, have had a quite different basis.

According to Harald Witthöft (1985), who has compared and combined the written and numismatic evidence with metrological studies, the monetary system in the Frankish realm was regionally based. The apparently unmotivated raising of the denier weight cannot be a direct result of the changing price differentials between gold and silver in the Caliphate and the Frankish realm as, for instance, the Swedish historian Sture Bolin (1953) proposed. Witthöft, by contrast, stands firmly against the national-economic point of view implicit in Bolin's theory. Even though the Frankish denier was, in economic terms, a fully functioning currency, the prices were not necessarily determined by market forces which reflected the purchasing power of silver in an internationally based trading system (Witthöft 1985:414–15). One of Witthöft's counter-arguments is that the silver penny was the only official coin-type in Europe for 500 years. The circumstances in which the standard weight of the Frankish denier was reduced or increased were not the result of an international silver supply that continually balanced the surplus or deficit in trade between East and West. The silver denier was, just like the gold coins before it, linked to the crucial role of the grain in exchange relations in the Frankish realm (Witthöft 1985:416–20). Counting in quantities of grains per unit thus equally constituted the essential matrix of reckoning in the Carolingian coin- and weight-systems.

The connexion between coin-weights and grain-weights has been most influential in the works of the numismatist Philip Grierson (1960, 1965). According to Grierson, the reform was primarily an administrative instrument intended to coordinate the various weight-standards of different regions into a common system (Grierson and Blackburn 1986:206). The raising of the mean weight of the denier after 793/4 was, in his view, probably the result of the introduction of the smallest and lightest of all types of seed, the wheat grain, as the basic unit of reckoning (Grierson 1991: 34). The wheat grain has the lowest specific weight of all forms of seed.[14] This replaced the earlier Merovingian grain-standard. Witthöft's further metrological studies have shown that the heavier denier could also be correlated with the grain-weights of other current but regionally specific grain-types in the Frankish Empire such as the "Netherlandish as" and "Paris grain", as well as with the Arab carat, which was the smallest unit of reckoning in the Islamic coin-system (Witthöft 1985:416–17).[15] The introduction of Charlemagne's new weight-unit, *pondus*

12 In terms of silver coins, 22 solidi of 12 coins means a maximum of 264 pence. If the minting was done according to the al pondo rule, i.e. to produce a specific number of coins per pound, the coins could vary in weight by some tenths of a gram (Grierson and Blackburn 1986:164; Morrison 1964:414–22).

13 At this juncture the weight of the pound was raised from c. 327 to c. 408 g (Witthöft 1985:410). It is assumed that two different official pound-weights existed as standards in the Carolingian realm. The weighing pound was probably that of c. 408 g following Charles's reform and the coin pound c. 435 g. This gave 240 Carolingian deniers or 20 solidi to a weighing pound or 264 deniers and 22 solidi to a coin pound. The coin pound was probably a product of the taxation of minting itself in the Frankish realm (Morrison 1963:417).

14 The nominal weight of the denier of 1.7 g corresponds to 32 wheat grains at 0.053 g (Paris grain) instead of the earlier Pepinid denier of 1.3 g, based on 20 grains of 0.065 g (Troy grain) (Grierson 1991:34).

15 The heavier Carolingian denier could also be correlated with a reckoning in carats as was practised in the Caliphate. The coin weight of 1.7 g is almost exactly 8 Syrian-Arabic qīrāṭ of 0.212 g. Witthöft also believes that Charlemagne's reform used the Islamic gold dinar as the basis for defining the pound (1985:410). There were 96 dinars to the Carolingian counting pound: 96 x 4.25 g = 408 g.

Caroli, should not be viewed solely as a monetary reform but also as the assimilation of various regional weights and measures standards. None of the three components – coinage, measure and weight – can really be distinguished in the Carolingian view, but are rather interwoven also with one another.

The Frankish commodity-money economy

Silver coins represented the central yardstick of value in the Frankish kingdom, but in mundane transactions constituted only one of several current ways of making payments – or forms of "money", to put it simply. The Frankfurt Capitulary of AD 794 provides a good example of this. The capitularies were juridical decrees that were written down on the king's authority and directed how the Frankish realm was supposed to be governed. In the Frankfurt Capitulary, Charlemagne's *denarius novus* is equated with a measure of volume, the *scapilus* or *modius* (trans. King 1987:225). The various types of grain have both different specific weights and different volumes. There were more wheat grains in a *modius* than, for example, grains of oats (Witthöft 1985:419). People were highly conscious of this, as the capitulary shows. Wheat was regarded by the capitulary as more valuable than the barley grain that was the earlier standard of the Merovingian and early Carolingian Periods. A *modius* of wheat was worth 4 new deniers, but a *modius* of barley grain only 2 (Tab. 8.1).

1 *denarius novus*	=	1 *modius publicus* (oats)
2 *denarii novi*	=	1 *modius* (barley)
3 *denarii novi*	=	1 *modius* (rye)
4 *denarii novi*	=	1 *modius* (wheat)

Table 8.1 *Official exchange rates between coinage and types of grain in the Frankfurt Capitulary (trans. King 1987:225).*

The capitulary also prescribes prices should one make use of bread as a means of payment. Here too the coins could be correlated with grains, albeit transformed into bread. A new denier should be of the same value as 12 loaves weighing 2 lb *(pounds weight)* each (Tab. 8.2). Coins and food are described as two synonymous and interchangeable ways of making payments.

1 *denarius novus*	=	12 wheaten loaves	of 2 lb
	=	15 rye loaves	"
	=	20 barley loaves	"
	=	25 oaten loaves	"

Table 8.2 *Relative values of 1 new denier and various types of bread in the Frankfurt Capitulary (trans. King 1987:225).*

Figure 8.5 *The coin-changing scene in the Utrecht Psalter. First half of the 9th century. Photo, University Library Utrecht, Netherlands.*

In the capitulary of 797 which made juridical orders for the Saxon area, it is stipulated how much a solidus should count for in relation to other goods (trans. King 1987:232). A solidus was used as a larger unit of reckoning which is described in the capitulary of having the value of 12 deniers. One-year-old cattle of either sex are valued at a solidus in both autumn and spring. After that the value rises with age. But the capitulary also gives directions as to how a solidus is to be reckoned in terms of oats, barley and honey (Tab. 8.3). Neither wheat nor barley are used as units of value. In this context, the capitulary distinguished between *Bortrini* and *Septentrionales*, presumably two primary regional units or population divisions amongst the Saxons.

1 *solidus* = 1 cow

Bortrini
1 *solidus* = 40 *scapili* oats =
20 *scapili* rye = 1½ *scapili* honey

Septentrionales
1 *solidus* = 30 *scapili* oats =
15 *scapili* rye = 2 *scapili* honey

Table 8.3 *Relative values between the solidus as a unit of reckoning and various foodstuffs in the Second Saxon Capitulary (trans. King 1987:232).*

The impression is given that the prices of grain and thus the use of and valuation of deniers were not primarily governed by the price-setting mechanics of the open market economy. The capitularies thus provide us with evidence of a mixed economy, in which both coin and food were used as forms of currency. Although the Frankfurt Capitulary specified penal-

ties for those who were not willing to accept the king's new coin in towns or any market places, they also left space for traditional forms of transaction. Natural produce such as grain and other foodstuffs were defined in fixed units such as, for instance, volume measures by the *scapilus,* and were thus interconvertible. They could be reckoned as currency and converted into coin. A denier can thus be understood both as a true coin and as a unit of reckoning. This double mode of reckoning was produced out of reckoning in grain. The silver denier was not just a minted piece of silver in the Carolingian realm; as the "grain denier" it was also a symbol of food. As an official standard of value and reckoning, coinage was thus only one of many different media of exchange in the Carolingian realm. The fixed prices for goods given in the capitularies had always to be convertible into the ruling coin-values. In the Frankish realm there was thus a monetary and commodity-money economy in action at one and the same time.

Dorestad – a hub for coin silver in the North Sea region

More than anywhere else, it was in areas where economic relations were densest, as in the towns or markets and significant trading sites, that silver coin came to be used in greater quantity. That large numbers of silver coins were dealt with in the Frankish realm using balances is shown by a weighing scene involving a coin-changer in the Utrecht Psalter, from what are now the Netherlands (Steuer 1997:257–9, fig. 178; Fig. 8.5). That coins were circulating in large quantities in Dorestad, one of the most important trading sides of the Carolingian Empire, is indicated by finds of heavy lead weights with coin stamps on them. Four specimens with impressions of Louis the Pious's and Charles the Bald's deniers are known from the emporium. Karl Morrison has attempted to correlate them metrologically with the Frankish pound. With certain margins of error they may fit various coin- or counting pounds (Morrison 1963:

423–4 and 431). The weights from Dorestad were made of lead. Lead is easy to shape and is also invulnerable to damage and corrosion. The unusual weights should therefore, in my view, be understood as the personal equipment of the coin-changers who were active in Dorestad and who needed to weigh and reckon in coined silver in larger quantities.

It was particularly in Dorestad – one of the great places of exchange of silver coins in the Carolingian realm (Coupland 1988) – that there was also a need to be able to correlate and calculate weights of silver in non-Carolingian silver coins and perhaps also in silver ingots against the current pound-weight or fractions thereof. It may be such a scene of coin-changing in which two individuals are making use of both balances and coins that is shown in the Utrecht Psalter. This psalter is dated to the first half of the 9th century and thus belongs to the same period in which a Frankish presence at Kaupang can be demonstrated (Wamers, in prep.).

There is manifestly a connexion between the regional use of coinage in the formerly Roman provinces of the Frankish Empire and the existence of coins that were based upon a tradition of reckoning that is based upon Antique models. The penny-based conventions of payment that were found in Dorestad involved massive exchanges of silver on a daily basis, taken care of by professional coin-changers. Dorestad guaranteed access to the North Sea region for the Frankish Empire. The contrasts between Dorestad, a major exchange site for silver coins, and Kaupang, with its few finds of Western European pennies, are thus stark.[16] In this case, the situation strengthens the impression that there was a quite different view of coinage in Kaupang in spite of the close contacts with the Frankish territories. The conventions for making payments comprising silver coin did not establish themselves here. In this respect, we might suggest that the lack of a strong political authority provides at least part of the explanation. It was in the Frankish realm, and in towns such as Ribe and Hedeby, that the conditions were present for the establishment of a monopoly of coinage. Such a monopoly always involves some form of taxation of goods and services, which consequently provided the royal authority with the chance to gain an income. In my view, however, political power is only one aspect of a practical monetary economy. Another aspect, perhaps even more important, is the credibility of the coins and thus their value in the eyes of those who use them: this is essential for them to be accepted. The question is, then, what mechanisms and ideas sanction the value of coinage in a Christian context? What eternal point of reference gave spiritual being to the value of the coins? In this regard, we need to look in more detail at the role the silver coins played in the world-view and self-perception of medieval Man.

Figure 8.6 *Louis the Pious portrayed as a Christian lord. From the work of Hrabanus Maurus,* De laudibus s. crucis, fol. 4^{v}. *Manuscript dated c. 840. Reg. Lat. 124 f. 4v, Photo, Biblioteca Apostolica Vaticana.*

"Give us this day our daily bread…"

The Carolingian, and later the Ottonian, emperors developed the right to strike coins into an exclusively royal right. In the Roman Empire, the right to mint was restricted to the emperor. It is, correspondingly, the secular-political aspect of the royal authority as coiner that is generally emphasized in numismatic history (e.g. Jonsson 1987:188–9). It was in the strength of the king's political authority and his power that he was able to introduce coins and practically force the population to adopt their use (e.g. Kilger 2000:93–4, 2004). But the emperors and kings did not represent political power alone; they were also the personification and representative of divine power. They were, in addition, religious leaders of the highest status. The Carolingian ruler guaranteed the value of the coin not only in his capacity of head of state but also in his capacity as God's representative on Earth (Steinsland 2000:92–6). It was first in the middle of the 7th century that the Merovingian kings were crowned as Christian rulers. The Frankish ruler no longer derived his character as a charismatic leader from the pagan gods but rather, via the sacrament, directly from the Christian God. He became *rex et sacerdos,* "king and leading pastor" (Duby 1987: 25). In the 9th century, Emperor Louis the Pious was represented as a shepherd with a crossed stave and simultaneously as Christ's soldier, *miles Christi.* His sacrosanct holiness is shown in the halo around his head and the inscription that goes with the picture (Fig. 8.6). The inscription on the halo declares "Thou, O Christ, crownest Louis" (Mütheric and Gaehde 1977:55).

16 As of yet, the finds from Kaupang offer no direct evidence of contacts with Dorestad — one of the principal trading sites of Western Europe — itself, but it is reasonable to presuppose that this was the case.

The capitularies also state that it was the king's duty to create a just society and to protect the poor from exploitation. The king personally sold his own grain at half price in the market (King 1987:225). In this way the king accepted his responsibility as the highest protective lord appointed by God over the people. As the representative of God and Christ on Earth, the kings were responsible for the distribution of the annual harvest. The capitularies state that the king answered for the equity of the prices for the necessities of life, such as grain of a fixed price, and that he guaranteed that all had food for the day (King 1987:225). It was only the emperor and the king who had the right to strike coins and it was the king, in his capacity as Christian leader, who could sanctify the coin and sanction its value. Coins, in the Carolingian realm, thus cannot be regarded as a solely political manifestation, but should also be seen as religious

expressions of food, the daily bread. In its standard character, the coin was a symbol of the king's divine and juridical power.

On the deniers of Charlemagne, the cross as the symbol of Christianity is very conspicuous. His final issue shows him as the diademed Roman Emperor on one face, while on the other face we see a temple building with a cross surrounded by the legend adapting Greek lettering XPISTIANA RELIGIO (Wamers 2005:155–8). Charlemagne's son Louis the Pious subsequently separated off the Christian statement in the markedly uniform and – for coin-users in the Carolingian territories – readily recognizable XPISTIANA RELIGIO issue (Fig. 8.7, c.f. Grierson and Blackburn 1986:pl. 36). It is also the deniers of Louis that are most commonly represented in finds from Scandinavia (Moesgaard 2004:13; Garipzanov 2005:56, tab. 1).

As I argued above, in the Antique conceptual world and even on into that of the Middle Ages, coins stood in a metaphorical relationship with the harvest and so with food (see p. 266–7). The nominal value of the coins was related to a specific quantity of grain, which guaranteed its metal contents and weight. In German, we have the expression that bread is of good "Schrot und Korn". *Schrot* refers here to the grade of ground grain that is used to bake bread. This expression is also found in a monetary context, when the reliability of the coin is referred to at the same time as establishing a connexion between coin and bread. Coins must be of good and pure metal, "Schrot", and weight, "Korn". The written sources also note that grain was one of the most important traded goods in the Frankish realm. Quantities of grain were counted in barrels, within which it was also transported (Doehaerd 1978:153–7).

It was the Church in particular which, starting in the Carolingian Period, initiated the use of coins as a method of making payments more widely in the population. Landbooks from the monasteries provide evidence of the widespread use of coin as form of cash. It was first and foremost the monasteries, that in their capacity as landowners could demand their dues and tithes in the form of coin. But it was also possible for the farmers to pay their dues in natural produce. The small monastery of Prüm was a major landowner. Of its 1,700 farms, 63% paid their taxes in coin. At the end of the 9th century Prüm could count on an annual income of over 80 pounds in coin, corresponding to about 19,400 pennies (Hess 1990:113). It was above all at local and regional markets and in towns which were under not only the saint's and the Church's blessing, but also the king's protection, that the year's harvest could be sold (Doehaerd 1978: 152–6). It was the monasteries that were the driving participants in the trade of foodstuffs such as grain and wine in the markets, and it was also the monasteries that regularly handled coin in large quantities both during and after the Carolingian Period. Various levies that the Church and landowners could exact from, for instance, merchants and farmers, have also been described as a primary motor for the establishment of the use of coinage amongst a wide segment of the population (Kilger 2000:96–7, 2004: 222–4).

But the compulsory element of monetization in the form of taxation provides us with only a superficial explanation and does not really get to the heart of coinage. What we also see is that ecclesiastical institutions and lords were able to root and legitimate coinage in a sacred sphere of value: in the Christian world-view. The connexion between coins, grain and bread is made prominent in the edicts on prices of the Frankish Empire (Tabs. 8.1–2). Wine too was a crucial element in the liturgy and so a traded commodity of the same importance as grain in Early-medieval Europe (Doehaerd 1978:153–7). Wine was bought by Frisian and Anglo-Saxon traders, every

Figure 8.7 *Louis the Pious's XPISTIANA RELIGIO denier. 1.69 g. 822–840. Size 3:1. Photo, Jonathan Jarrett, Fitzwilliam Museum, 2006.*

year at the same time in central wine markets such as that at St-Denis outside Paris (Doehaerd 1978:186; Theuws 2004:126). Bread is the foodstuff that is referred to in the Creed and the Paternoster. Bread and wine represent the body and blood of Jesus in the Eucharist. In my view, one can thus argue that there was a metaphorical association of the immaterial value of the coin with Christian values. What could not be obtained but was at the same time desired by all – and that which sanctioned the monetary power of the Carolingian silver coinage – was the promise of the forgiveness of sins and the hope for daily bread. The value of the coinage can thus be linked also to the Christian understanding of salvation and eternal life. It was in this way that the silver coin gained its *inalienable* point of reference, one inhering in the Christian world-view. The coin derived its monetary power from an unreachable kingdom in Heaven. This impalpable heavenly fixed point rendered the coin a value exceeding its weight and contents. It was through the coin's connexion in the mundane contexts of payment for bread, grain and wine that coined silver gained its credibility in the eyes of the Christian community.

The metaphorical relationship between harvest, coinage and profit was also celebrated annually in the autumn at Michaelmas when the coins came to be used in the market and the year's harvest was exchanged. On this occasion the coin-lord was also able to introduce a new type of coin and compel the old type to be exchanged for it (Spufford 1988:383). The market days have commonly been regarded as a political and institutional arena for the power politics of the coin-lord, as a practical situation in which coins came to be used and circulated amongst a considerable proportion of the population. But the annual marketing of the harvest was also a religious ritual, the participants in which could cross boundaries and redefine the value of objects of exchange. It was then that the *face*-value of the coin, with the portrait of the king or the saint and the town or temple on the one face and the cross on the other became of value, but at the same time became *alienable:* in other words, exchangeable. Through the process of exchange of coin at the market place the nominal relationship both between one coin and others and against other exchange goods was defined. It was only at these festivals where large numbers of people were assembled that the elite could deal with and redefine the status of the crucial objects of value (Theuws 2004:125–6). Through the metaphorical relationship of the coin with food such as grain and bread, a very wide range of different forms of transaction were covered.

In my view, the Frankish silver coins were both materially and immaterially rooted in a world of Christian concepts. From such a viewpoint, coins were not only objects of value in both political and economic terms, but also woven into a Christian reality and the self-perception of the faithful. As we shall see in the next section, however, coins were also struck and used in Scandinavia: in other words, in a non-Christian context. A fragment of such a non-Christian coin, probably struck in Ribe after c. A.D. 825, was found in the settlement area of Kaupang (Blackburn, this vol. Ch. 3:58, Fig. 3.17.c; Rispling et al., this vol. Ch. 4:No. 5). Does this find face us with a concept in which immaterial and sacred concepts of value were integrated with features that symbolized a nominal unit of reckoning, just as with the Carolingian coins?

The snake, the long-haired man, and the monster: the use of coin outside the Romano-Christian orbit

As we have already seen, Carolingian coin was endowed with value from an Antique-Christian ideological tradition by being linked to the potency of the seedcorn as life-giver and normative building block. The Christian symbolism centring on the cross is most evident with the Frankish issues of the 9th century. On one group of the Southern Scandinavian coins contemporary with the XPISTIANA RELIGIO deniers, and which are possibly to be attributed to Hedeby, alternative motifs to the cross appear, such as the ship, house, fish, animal/stag, snakes, cocks/grouse, or a man with a horn (Malmer 1966:47–8, 58-63 pl. 1–2). Although the motifs may in some cases allude to Christian symbolism, such as, for instance, with the fish, and to motifs that are also found on Frankish coins, such as the ship, these are nonetheless in respect of specific details very different from the contemporary Carolingian deniers (Malmer 2002a, 2002b). On the other connected group of Southern Scandinavian coins there is a stylized human mask, small human masks with a moustache, snakes and a zoomorphic body (Fig. 8.8) (Malmer 1966:48, 63–7, pl. 2–3). The group with the "radiate

mask" and "stag" or "animal" is clearly modelled upon earlier sceattas with what is known as the Wodan-Monster motif, which in all probability reflects no Christian concepts. It is a matter of contention whether or not the minting of these sceattas took place in Frisia or in Ribe in the 8th century (Metcalf 1984, 1985; Malmer 2002b:118–20).

The pictorially rich early Nordic issues are found primarily in the cemeteries of Birka, and are consistently from rich female graves. Here they were reused as pendants and associated with other pendants as part of sets of jewellery (Malmer 1966:184–5). But in their original places of use, at Hedeby and Ribe, they were used as a standardized form of currency which was directly linked to the Carolingian monetary system. This is indicated by both the technical production and the weight, which was almost exactly half that of Charlemagne's heavier *denarii novi* (Malmer 2002b: 120–1). However this was probably not sufficient for the coins to have been accepted as currency in Hedeby and Ribe without also being linked, as the Carolingian deniers, to an overordinate concept or religious belief that could endow them with credit. In this context, we need to look more closely at the motif that was displayed upon the coins and whether that could contain the associations necessary for the coins to be regarded as of value. How are we to understand the Wodan-Monster motif in this respect?

What Brita Malmer describes as the "radiate mask" on the 9th-century Scandinavian coins is as far as I can see really a highly stylized human mask. The lines that radiate out from the eyes and nose in two symmetrically opposed fields resemble a human mask with long hair and a parting. The curved lines below the nose represent a moustache and beard. This central motif is surrounded by small, bearded masks along with coiled snakes and figure-of-eight motifs. On the obverse we see a hatched, zoomorphic body with the head turned backwards. Below the body there is a coiled snake and a three-pointed symbol (Fig. 8.8). This typical representation of a human mask is found on many other objects besides coins. The same elements – animal, snakes and human masks with long parted hair – recur in pictorial art in Scandinavia from the Iron Age to the Christian Middle Ages (Johansen 1997:75–107). The scene is also portrayed on female jewellery such as brooches and buckles such as the Scandinavian oval ("tortoise") brooches (Jansson 1985). The composition is also found on brooches from the Merovingian Period. It is found, for instance, on the famous splendid buckle from the Åker find in Norway (Nybruget 1992:24; Solberg 2003). On the Åker buckle the man becomes part of the fabulous animal. His body is scaly like a snake and his feet transformed into two shining dragons' heads. The scene on the buckle, on coins, and on other artefacts, is probably the same one, presumably representing a known mythological motif of the North. It is a scene with some ecstatic content in which a man is wrestling along with one or more animals and snakes in various permutations.

Investigation of the different iconographic components of the Nordic animal style indicates that the scene represents Odin's battle with the wolf Fenrir and Midgard-serpent (Neiss 2004). This motif, which starts to appear first on Migration-period bracteates and is subsequently found represented in both Vendel- and Viking-period animal styles, consists of a man with one or more snakes which are battling with two animals. Those consist of a ribbon-shaped animal and an h-shaped animal which are interlocked. Starting from the cosmological outline given by Snorri in *Gylfaginning,* Michael Neiss (2004: 20–1) interprets one of the figures as the Midgard-serpent which surrounds Midgard and bites on to his own tail. The other figure is Fenrir, who is fettered with a strap and is then chained fast, deep in the

Figure 8.8 *Scandinavian coin with a radiate mask and animal. Malmer KG 5 (Malmer 1966). Ribe? c. 825–850/77. Björkö, Adelsö parish, Uppland. Birka grave no. 508. SHM, no accession number. Scale 3:1. Photo, Frédéric Elfver, Stockholm University.*

ground. The snakes that are biting the two animals or are coiled around the man's hands represent the powers of order. These are interpreted as the gods' retinues and auxiliaries in the battle against Loki's offspring. In a shamanistic perspective, both the snake and the gripping beast can be viewed as a vessel for Odin's soul which borrows that body for the journey to another world where, together with the snakes, it will do battle with the menacing wolf which threatens the cosmic balance. In order to carry out this perilous journey the shaman was dependent upon helpers in the form of animals whose duty it was to protect his soul (Hedeager 2003:131–2). It was the gods Odin and Loki more than any others who could change shape (Jennbert 2004:205). In *Skáldskaparmál,* we read how Odin first changed himself into the shape of a serpent and then into that of an eagle in order to steal the giant Suttung's mead (Byock 2005: 85–6). The three-pointed triangular shaped object that is shown on the obverse of the coin is apparently interpretable as a representation of the world tree Yggdrasil (Andrén 2004), and the zoomorphic body as the dragon Nidhögg who lived in the nether region of Niflheim and chewed at the roots of the tree *(Grimnismál* 35). Odin also had two by-names, Ofnir and Svafnir, which are also the names of the two snakes that are coiled around and bite the roots of Yggdrasil *(Grimnismál* 34 and 54). The animal is also shown on some coins as a stag, which may reflect the four stags who dwelt beneath the shady canopy of the ash tree Yggdrasil (Malmer 1966:pl. 2; Byock 2005:27). The design on the coin is polysemous, and has space for further plausible interpretations (e.g. Malmer 2002a). To read the mask as a representation of Odin seems attractive, but there are also bronze figurines from Uppåkra amongst other sites which represent the god with only one eye (Bergkvist 1999:119–21). However I consider it most credible to regard the human mask as a representation of the god Odin, and this gives a deeper sense to the monetary angle that I wish to impart to the Scandinavian coins.

The first Scandinavian coins may, in my opinion, show that there were other systems of thought and understanding – possibly in direct competition with the Christian ideology of lordship – which, in the eyes of the coin-user, make the struck metal "valuable". But in contrast to the Christian conceptual elements embedded in the Carolingian deniers the Scandinavian coins derived their monetary power from a different religious universe. It was the serpents, the monster-stag, the three-pointed object and above all the shape-changing long-haired man with his parting as a mythological projection which formed the basis for associations of value. Like the cross in the Christian context, the human mask presumably had a legitimating character – as did the snake. The Danish leader who introduced the minting of coin, apparently at Ribe, using the famous Wodan-Monster motif, may himself have assumed the role of the powerful individual in the myth who suppressed the wolf Fenrir and who had the power to change shape. The myth had the power to create value. Odin subdues the forces of chaos and thus guarantees the maintenance of balance and so of order in the world. Projecting the familiar myth on to himself, the leader was also capable of breathing life into the coin and guaranteeing its nominal value within the area of his own power. It was Odin who guaranteed the continuation of the world and who provided coinage with a cosmological authenticity and religious aura, and with that made it of value in the eyes of the coin-user.

From the iconographical perspective, the first, pictorially rich, coinage of Southern Scandinavia represents nothing new, but in its selection of motifs was rather a continuation of the extensive application of symbolism in the sceatt coinage of the North Sea area. The same composition of pictorial elements and symbols is also found in the Northumbrian coinage of Northern England in the 8th and 9th centuries (Pirie 2006:pls. 6–7). The use of sceattas reached its zenith during the first half of the 8th century in the emporia and productive sites of England as well as around the North Sea (Blackburn 2003). Neither sceattas nor Scandinavian coins came to be used in any monetary way outside of Ribe and Hedeby in Southern Scandinavia. It is evident that the use of coinage was only established in Scandinavia at sites which were in direct contact with other coin-using areas on the Continent and Britain during the 8th and 9th centuries. When the Viking-period production of coinage got under way in the second quarter of the 9th century, written sources testify to the close political contacts between the Danish elite and the Carolingian royal house (Varenius 1994). Outside of these early monetary zones in Southern

Scandinavia, meanwhile, the monetary character of the Scandinavian coins as a form of a currency fell away. They were used in the same way as other coins such as dirhams, Carolingian deniers and Anglo-Saxon pennies as pendants in richly furnished women's graves or outstanding mixed hoards (Garipzanov 2006; Kilger 2008). In these hoards, such as that from Hoen, the largest Viking-period gold treasure from Norway, the coins were re-used as pendent ornaments (Skaare 1988:54–7). Here they probably carried a different set of value-associations than in their original monetary context. I shall now attempt to summarize this section of the chapter and to answer the question I posed to begin with. Why was the use of coinage able to establish itself in the Frankish realm and in certain parts of the North Sea area but not in others? And why were coins not used as a form of currency in Kaupang?

Conclusions

In order to be able to understand the distinctive situation regarding coin-finds over most of Scandinavia and at Kaupang in the 9th century, I presented, by way of introduction, the way in which monetary systems were defined and conventions of payment put into effect in the Frankish realm. In that territory, gold and later silver coins were filled with meaning and associations of value so that they could be integrated into various economic constellations. Decisive for the understanding of monetary methods of payment in the Carolingian Empire and previously in Late Roman and Merovingian contexts was the existence of fixed relations of count that the system of coinage was based upon. By using grain in the reckoning of coinage, a holy unity was created between coins as a medium of value and coins as counters with which to make calculations. Grain was not only the indivisible base unit of the monetary system but also the fundamental constant used in the weight-system. The use of coin in the Frankish realm reflects conventions of valuation and payment that stretch back to Antique models.

As a result of the archaeological studies, we now have good evidence that there were contacts with the Frankish realm from Kaupang in the first half of the 9th century. The gold tremissis struck in the 7th century by the moneyer Madelinus in Dorestad may have been brought by a merchant from that Frisian emporium to Kaupang in the Viking Period. Finds of brooches, shoe-buckles and other ordinary dress-accessories show that individuals from the western areas of the Frankish realm resided in Kaupang (Wamers, in prep.). These people were undoubtedly familiar with the use of silver coin as a form of currency but they evidently did not take coins with them on their trading journeys to the North. The reason why there are so few Carolingian deniers in Southern Scandinavia in the Viking Period is probably that they were melted down before they could pass into circulation. Coined silver was re-worked into uncoined metal in the form, for instance, of ingots, before being re-distributed within Scandinavia. This may have been done in Frisia itself. In Dorestad, for example, soapstone moulds for ingots of the common Scandinavian type have been found (Besteman 2004b:28–9 and 33). People were familiar with the practice in Scandinavia of handling and valuing silver in larger quantities rather than in the form of coin silver. The lump of semi-melted dirhams that was found in Kaupang during the most recent excavations and which appears to have been standardized in terms of weight may also bear witness to this practice (Blackburn, this vol. Ch. 3.1.2, Fig. 3.1).

All the same, the use of coin in exchange relationships during the Viking Period did not rely solely upon an acceptance of the principles of reckoning to be found in a conventional monetary system. A further precondition was a group of people with a common world-view and shared values. Monetary ideas, in my opinion, were only traded in a community that accepted and shared the sacred principles that resided in coin, not only as a medium of valuation, but above all as an object that had a value *in itself.* The Frankish denier represented the Christian world-view and the social and political order of the Frankish realm sanctioned by God. The same identity-forming mechanisms were probably also in effect in the earliest Scandinavian coin-production of the 9th century. The Odin cult presumably provided the spiritual matrix for the infusion of the coin with the credibility needed. The earliest Scandinavian coinage probably did not derive all of its diverse symbolic elements directly from Carolingian contexts but also from the sceatt culture that flourished in the North Sea region from the late 7th century onwards. This monetary culture had its foundations in the large number of wics found along the North Sea coasts and was probably in the hands of the local traders that we know of from the written sources (Lebecq 2005:646–53). Although the minting of coins at Hedeby and Ribe alluded to a pagan symbolism, the coin-standard of the Carolingian realm was respected: the coin-weight of Charlemagne's reformed denier was used, and the new Carolingian reckoning pound was the point of reference. As Scandinavian coins weighed nearly half what Carolingian coins weighed, this probably meant that in and around Hedeby and Ribe the Carolingian coins were counted as of double the value of the Scandinavian ones.[17]

Silver coins probably never came to be used as "money" at Kaupang. We do not see any evidence of a powerful lord who succeeded in introducing, controlling and bringing a monetized system to life. And there was probably also no *community* of coin-users, a commonality of value, who shared a set of cultural norms and who had common religious frames of reference. The use of coin was accompanied by a system of calculation for reckoning goods in trade and exchange. The monetary system produced a matrix for different systems of measuring and reckoning which formed both a consciousness and also a knowledge of how one could relate different goods to one another. Although the knowledge of such a monetary matrix was in all probability shared by Scandinavians in the 9th century, they did not bring coins back with them. Nor did anyone try to introduce a monetary *habitus* that observed the same rules of play and ideas as on the Continent or in Britain. There was evidently an invisible threshold that no one was prepared to cross. Looked at in a monetary perspective, Kaupang was a site which had neither the political nor the ideological or mental conditions for the use of coinage to have been able to take root gradually in the same way as it did at Hedeby, Ribe and Dorestad. (For a different view, see Skre, this vol. Ch. 10:347–51.)

But how were economic relations in Kaupang governed if coin was not brought into use there? Was there some other form of "money" in Kaupang, which allowed exchange across ethnic, cultural, religious and economic boundaries? It was such a situation which men like Ohthere, who were engaged in long-distance trade and who travelled between important trading sites in Scandinavia, had to deal with. This is the issue that we shall examine in more detail in the following section. In so doing, we shall move our viewpoint from the use of coin in medieval Western Europe to the unmonetized Iron-age societies of Scandinavia.

8.4 Traces of the eyrir-standard at Kaupang

The most recent archaeological investigations have shown that Kaupang was a central place for exchange and production in Viken from the beginning of the 9th century (Pilø 2007c:175–8, 2007d:195; Pedersen and Pilø 2007:187–90). In one form or another it had exchange relations with areas of Western Europe where monetary rules and concepts were in force. As I have already discussed, people from the Frankish lands who were resident in Kaupang were undoubtedly thoroughly familiar with the significance of the Carolingian denier, both as a form of currency and as a standard. Although coins were not accepted as currency in Kaupang, was there nevertheless some standard or scale of value that those who came to the site could use to reckon with and think in, and to compare diverse goods with one another? Was there any other form of "money" at Kaupang that permitted exchange across ethnic, cultural and economic boundaries?

I believe that some part of the answer lies in the evident standardization by weight of precious-metal objects such as gold rings (Bakka 1978; Munksgaard 1980; Graham-Campbell 1999) and silver rings and ingots (Hårdh 2006, this vol. Ch. 5.6.1 and 5.7). This standardization by weight of finds from the Iron Age was first systematically described by the Norwegian archaeologist Anton W. Brøgger (1921), in his dissertation on the Scandinavian *eyrir*. Brøgger made a meticulous attempt to link information on a Scandinavian weight-system as it was described in Norwegian law-codes from the High Middle Ages with concrete archaeological finds: weights, gold rings and coins. In the introduction to *Ertog og Øre,* he wrote:

> The sources for the study of the history of the earliest Norwegian weights are first and foremost archaeological. In the old Norwegian laws we find a fully developed and firmly fixed theory of weight, the origins of which reach back long before the time at which the laws came to be written down. The prehistory of this system has to be sought in the corpus of weights unearthed from the ground, and then in the gold and silver finds that have been made in great quantities in Norwegian soil (1921:1, *trans.).*

At the heart of Brøgger's work was a comparative metrological analysis of Norwegian weight-sets from the Early Iron Age and the Viking Period. The weights in the sets were very precisely calibrated – in other words, they conformed to a single standard. That the individuals who produced these sets thought in terms of a weight-standard is manifested in two different ways. In the first case, the weights in each set were so finely adjusted that they varied from one another only by as little as a tenth of a gram. In the second case, Brøgger was able to demonstrate quite unambiguously that all weight-sets – looked at in terms of the modern metric system – are calibrated to a basic unit of c. 26.3–26.8 g. Brøgger then connected this archaeological weight-unit with written and numismatic evidence from the Middle Ages. Accord-

17 The mean weight of the pictorially rich Scandinavian coins was placed by Brita Malmer at 0.8 g (2002b:121). If one started with the Carolingian reckoning pound of c. 408 g, one would get c. 480 Hedeby coins to the pound. Counted against the grain standard, the weight of a Scandinavian coin comes to 15 wheat grains by the Paris standard (i.e. 15 x 0.0053 = 0.795 g); against the lighter Frisian as standard 17 wheat grains (i.e. 17 x 0.048 g = 0.816 g) (Witthöft 1985:416). In order to deal with silver in smaller units than the pound, the moneyer at Hedeby could also make use of the weight-unit lod. The lod was introduced as a practical unit of reckoning with Charlemagne's reform. There were 30 lod in a Carolingian reckoning pound: i.e. 408 g/30 = 13.6 g (Witthöft 1985:409). The lod corresponded to 8 Carolingian deniers or 16 Scandinavian coins in weight. We do not know which grain-standard was used in Hedeby and Ribe. But with the large-scale exportation of basalt quernstones from the Rhine valley to Hedeby we can probably assume that Frisian and Frankish wheat also followed that trade (Schön 1995).

ing to those sources, the Norwegian mark defined by royal authority in the year 1286 could in modern terms – according to the metric system – be reckoned to a value of 211.3 g, and correspondingly the *eyrir* to about 26.4 g (Brøgger 1921:95). As a result, Brøgger could argue that the *eyrir*-unit had existed for several centuries and that the same weight-standard was already in use in the Early Iron Age (1921:5–8). It was this basic unit that Brøgger called the early Scandinavian *eyrir* (Norw. *øre).* In my view, thinking in terms of the *eyrir,* pl. *aurar* (also *øre),* was a reality for those who had to deal with precious metal in larger and properly compared quantities.

From Scandinavian written sources we know that alongside the øre in the medieval weight-system there were two other units of reckoning. The system comprised the mark, the øre and the ertog. There was an unvarying set of relations whereby 1 mark = 8 øre = 24 ertogs. One øre was therefore the equivalent of 3 ertogs (Brøgger 1921:9; Rasmussen 1955:421). However, none of the finely calibrated early øre weight-sets that Brøgger had examined could be made to conform to this system of relationships. None of the weights in the set was adjusted to represent the ertog. This means that none of the weights could be multiplied by three to match the weight of the øre in the set (Brøgger 1921:9). It is not before weight-sets of the 10th and 11th century that the division of 1 øre into 3 ertogs becomes apparent. This is the case in particular with those sets that contain the Oriental weights of oblate spheroid type (Brøgger 1921:82–5). What Brøgger was also able to observe was that the øre in these weight-sets displays a clear reduction in mean value. Instead of an average of 26.4 g it weighs around 24 g. Brøgger called this lighter unit the later Scandinavian øre or the ertog-system. For the ertog, he could identify a metric weight of about 8 g from the weights. Reckoning in ertogs thus seems to be an innovation of the weight- and reckoning systems of the Viking Period which became established at a later date. However this did not drive the early Scandinavian øre out of use. As a result, there appear to have been two parallel weight-systems in the later Viking Period which are also still evident in the coinage and weight-systems of the Christian Middle Ages.

There is a big gap between the archaeological øre represented in the weight-sets and anything that can be identified in the documentary evidence. The *ora* is referred to as a unit of reckoning for the first time in the treaty between Edward the Elder, King of Wessex, and the Danish leader Guthrum (Attenborough 1922: 103–8). The dating of Edward's law is uncertain, but it is thought to have been written down at the latest in the reign of either Edward or his son Æthelstan, in the first half of the 10th century (Attenborough 1922: 97). Edward's overlordship was then recognized in those areas of the Danelaw south of the Humber (Keynes 1999:69). In clause 2, a fine of 12 øre *(oran)* is stipulated for priests in the Danish areas who do not fulfil their duties in providing the sacrament of baptism (Attenborough 1922:105). In clause 7, trading on a Sunday, *sunnandæges cypinge,* is punished. Besides the loss of one's goods, there is a fixed fine of 12 øre in the Danish territories and 30 shillings in the English (Attenborough 1922:107).

The other early textual evidence of the øre is the runic inscription on the Forsa ring, from Hälsingland in Sweden. Aslak Liestøl (1982) has dated this inscription to the late 9th century. The majority of scholars who have worked on the Forsa ring, however, argue for a later dating, to the 12th century (Engeler 1991: 128). Liestøl's suggestion has nevertheless recently been corroborated by Stefan Brink's studies. Brink (1996:36–9) interprets the inscription as an order to maintain a pre-Christian cult place in an orderly manner. The inscription on the ring specifies a fine that is to be paid both in livestock and øre, and which is doubled on repeated contraventions. One ox and 2 øre are to be paid on the first occasion, 2 oxen and 4 øre on the second occasion, and 4 oxen and 8 øre on the third. Based upon the few contemporary documentary sources of the Viking Period, the øre appears to have been a familiar unit of reckoning that was used in paying fines. In the English law-codes and on the Forsa ring the øre appears as a quantifiable unit of value which came to be used in the juridicial sphere. But was the øre also significant as a normative value in the economic sphere? We shall examine this question carefully here, in connexion with Brøgger's early Scandinavian øre. The later Scandinavian øre, or ertog-system, will then be discussed in the following section.

What makes Brøgger's discovery less applicable to an understanding of the significance of the øre in the system of exchange within the Iron Age is the fact that he was absolutely convinced that it had a Roman origin. This confidence was systematically expressed in his works, in which several of his reckonings look artificial and arbitrary. He consistently relates all of his calculations to Antique coin- and weight-units. It is Brøgger's theory of a Roman source that I shall modify from both archaeological and numismatic angles. I propose instead that the øre was established as the standard in Scandinavia, not during the Roman Iron Age or the Migration Period but rather in the Merovingian Period. A second set of problems I discuss in this section is how to relate the øre-standard methodically to the use of silver as a medium of payment and valuation. To do that, I must take a detailed look at the mutual relationships between coins, weights and rings.

Gold coins and the concept of aurar

There is generally agreement that the Old Norse term *eyrir* is a loanword derived originally from the Latin adjective *aureus,* "golden" (Engeler 1991:128). *aureus* is itself an abbreviation of *aureus nummus,* the term for the normative basic gold coin of the Roman Empire before the coin-reform of Constantine the Great (see above, p. 265). It seems likely that this appeared as a loanword in the North Germanic language of Scandinavia as early as the Roman Iron Age. If so, this must have taken place before the introduction of the solidus as the new gold standard in the early 4th century. Early Roman aurei are rare, but do occur in Scandinavia, particularly in Denmark.[18] The solidus, the "solid gold coin", became very familiar as a coin in currency in the Roman Empire, as is noted in the ancient written records (Brøgger 1921:64; Engeler 1991:128). The great influx of gold coin into Scandinavia, however, did not begin until the Migration Period. The earliest solidi known in Scandinavia were struck under the Western Emperor Honorius (395– 425). A high proportion of solidi are also from the Eastern Empire. The importation of solidi from the Roman Empire lasted some 150 years and came to an end in the mid-6th century.[19] If we look at the finds of gold coin from Scandinavia altogether, it is probable that the word *eyrir* refers first and foremost to the solidus.

There is a range of evidence that solidi in this period were used as raw material in the production of solid gold objects. According to Kyhlberg (1980b: 26–9), analyses of both the metal contents and weights show that the snake-headed rings of the Late Roman Iron Age (c. AD 200–400) and the Migration-period *Kolben*-armrings (c. AD 400–550) were in all probability made from gold from solidi. It was in the Scandinavian Age of Gold in particular, the Migration Period, that gold coins such as solidi may have become generally familiar in Scandinavia. This is also the period for which we can conceive that the preconditions for a Latin word for gold coin being adopted in the local vocabulary were met. But why, then, do we not find the word *solidus* rather than *eyrir/aureus* as the loanword in North Germanic? And how, then, can *eyrir* refer to earlier Roman gold coins that are scarcely represented as coin finds in Scandinavia? There are both philological and numismatic grounds for concluding that *eyrir* need not necessarily refer to a type of Roman gold coin but rather to a Frankish one. Let us look at these grounds in more detail.

The Germanic kingdoms that emerged in the formerly Roman provinces such as those of the Franks in Gaul, the Visigoths in Spain, and the Ostrogoths and the Langobards in Italy, continued minting coins in the 6th and 7th centuries (Grierson 1991:9–28). Historical evidence shows that gold coins were known by several names in the new kingdoms. In the famous encyclopedia written by the Visigothic Father of the Church Isidore of Seville in the 620s, it is recorded that *aurei* was the current term for gold coins that were formerly known as solidi in the Gallo-Germanic lands (Brøgger 1921:44 and 96–7, 1936:80). Bishop Gregory of Tours (ob. AD 594) refers to both the *aureus* and the *triens* – a one-third gold coin – as the coin units in the Frankish territory (Grierson and Blackburn 1986:102). Another Germanic word for gold coin was *skilling.* The shilling is first referred to in Ostrogothic texts from the 6th century, and in the Ostrogothic territory the term was used of Byzantine gold coins (Grierson and Blackburn 1986:15; Engeler 1991:167). In the 7th century, *scilling* was the term for gold tremisses struck in the Anglo-Saxon kingdoms (Grierson 1991:18 and 24–6).

A credible explanation of the diversity of terminology for gold coins in the Germanic kingdoms is that autonomous minting of gold coins was beginning. This process accelerated in the 6th century with attempts to mark political and economic independence from the powerful Byzantine Emperor in Constantinople (Blackburn 2005d). But it was particularly the reduction of the standard gold coin in the Merovingian kingdoms after around AD 580 that made it necessary to distinguish between the heavier Roman-Byzantine gold coins and the lighter Frankish issues (see above, pp. 265–6). *Eyrir* could, then, be a loanword from the Frankish *aureus* which found its way into the North Germanic through contacts with the Merovingian kingdoms following the collapse of the Western Empire. However we have very few finds of gold coins from the Merovingian Period in Scandinavia (Hatz 1981). How could *aureus* as a coin-term with primary reference to a Frankish gold coin have become so significant that it came to denote a weight-unit in the Scandinavian languages? In this respect, there is another critical piece of the jigsaw to put in place in order to understand what *eyrir* seems to have meant.

A significant clue is the fact that the øre-unit never corresponds to the weight of Roman gold coins, be that the earlier aureus or the Constantinian solidus. Rather, the Scandinavian øre is clearly related by weight to the Roman ounce *(uncia)* (Engeler 1991:130). But what was a Roman ounce? This ounce was used as a small, practical weight in the Roman and Frankish territories in order to measure substantial collections of gold coin in an easy way. *Uncia* lit-

18 A perforated aureus struck in the year AD 141 under Faustina the Elder is known from the Danish weapon hoard in the bog at Ejsbøl, Southern Jutland (Horsnæs 2003:337, fig. 3). This coin was found together with four fragmented gold neck-rings. The assemblage in this bog is dated to the second half of the 3rd century (Andersen 2003:250–1, fig. 7). In the gold hoard from Brangstrup on Fyn 27 aurei and three forgeries were found (Jørgensen et al. 2003:425, pl. 7.3).

19 The latest coins known in hoards in Scandinavia were struck for the Byzantine Emperor Justinian I (527–65) and the Frankish King Theodebert (534–48) (Kyhlberg 1980:39).

erally means a twelfth of some unit, in this case a twelfth of the Roman pound-weight, the *libra.* The Roman ounce could be produced by 6 gold solidi and the Frankish ounce by 20 gold tremisses.[20] There is evidence that the ounce as a weight-unit remained in use even later, in the 9th century, on the fringes of Western Europe. This is the case, for instance, in areas such as Ireland, which did not yet then have its own coinage. Examples are the prices given in the Book of Armagh. These are cited in the unit of the *unga,* a loanword that derives from Latin *uncia* (Wallace 1987:213–14). According to Patrick Wallace, *unga* may refer to a standard weight that has been recognized in the corpus of weights from Dublin. The same standard is also found in the large collection of ingots and armrings from Ireland (see p. 286, Fig. 8.11).[21] This Irish weight-standard seems to have the same modular value as the Scandinavian øre identified by Brøgger (1936:79). The øre, in turn, probably relates to the practice of producing substantial, well-proportioned modular units of precious metal with the aid of a set number of coins. A linguistic analysis of the term points the same way. Philologists point out that *eyrir* has an archaic plural form in the texts. In the Old Norse area we find *aurar* rather than **eyrar* (Engeler 1991:128–9).[22] The preservation of this plural form may have a very particular meaning. In the spoken language, it may have represented how people sought to express the practice of producing large units of reckoning with the aid of a certain number of coins.

My conclusion, then, is that in the North Germanic area *eyrir/aurar* did not denote a coin as an object but rather objects of standardized weight that could be calibrated with the help of gold coins. In this way, *aurar* become units of reckoning at the same time as referring to an abstract unit of weight and value. *Aurar* was in all probability a Scandinavian word for the Merovingian ounces. Using the term *aurar,* people probably referred to gold coins that in the Merovingian realm were called *aurei* and *trientes.* I believe, therefore, that *aurar* had several concurrent meanings. It may originally have denoted objects that *were made* of Frankish gold coin or of gold coins generally. In a more specific sense, it may have referred to gold objects, standardized by weight, which *were manufactured with the aid of* Merovingian gold coin that served as a means of calibration. It is in this specific sense that I use the term *aurar* henceforward in this chapter. I suggest that *aurar* represent something like a monetary concept amongst non-monetized societies. In monetized societies, coins are used as money. There, counting coins creates the scale required. In Scandinavia, *aurar* probably had a comparative sense, as a measure both of payment and of value. Reckoning in *aurar* referred to a single scale which was thus calculable.

Reckoning *aurar* according to the Early Scandinavian law-codes

That *aurar* as the units of weight and reckoning were composed of several coins is also stated in Norse law-texts of the 12th century. It is in the famous counting of rings, *Baugatal,* which was incorporated in the Icelandic law-code *Grágás,* that coins are linked to the øre as the basic unit of account (Karlsson et al. 1992:455–6). *Baugatal* is one of the earliest written accounts from Scandinavia on how one should measure an øre and is therefore a crucial source in the present context. The text describes a complex system of compensation for manslaughter which is to be paid by one kindred to another in the form of rings. In the last section of *Baugatal* it is stipulated what the criteria for a compensation ring of silver being regarded as an acceptable object of value at the *thing:*

Það er silfur sakgilt í baugum, og svo í þökum og þveitum, er eigi sé verra heldur en var lögsilfur hið forna, það er tíu penningar ger eyri, og meiri sé silfurs á en messingar og þoli skor og sé jafnt utan sem innan. (Konungsbók 113).

The silver valid as atonement in rings, and in supplements and bits, is such as is no worse than the ancient legal silver was with ten pennies making an *eyrir* (author's translation), looking more like silver than brass, standing up to the test of a cut and of one quality inside and out. (Trans. Dennis et al. 1980:183).

The reliability of *Baugatal,* which was written down in the 12th century in order to represent the current legal organization of Iceland, is disputed. The payment of rings extends to the fourth generation between kindreds. A number of historians have consequently rejected the value of *Baugatal* as a credible source (Sawyer 1982:44–5; Miller 1990:144–5). Although the complicated arrangements for compensation that *Baugatal* expresses can be questioned over matters of detail, there is sound archaeological evidence for the same practices for the valuation and checking of the silver content of rings, and also coin and hacksilver. The purity and consistency of silver were tested by cutting into the metal with a knife (Kilger 2006b). There are examples of silver rings having been forged by putting a thin coat of silver over a copper core (e.g. Stenberger 1958:233–4). And there are several examples of silver in rings and ingots having been alloyed with other metals (e.g. Arrhenius et al. 1973; Kruse and Tate 1992). This section of *Baugatal* on *lögsilfur hið forna,* "the ancient legal silver", therefore in all probability describes a current practice for assessing the weight, purity and consistency of the old legal silver (Hatz 1974:100). In my view, this section is most unlikely to be a fiction of the 12th century, but rather reflects a detailed knowledge of the use of silver in the Viking Period. This may change our view of the whole of *Baugatal* and put its compensation arrangements in a more credible light.

However, let us take a closer look at the øre that are referred to in the text. For the øre to gain legal force, it had to consist of a specified number of pennies. This is stated in the formulaic expression "penninar ger eyri" (Engeler 1991:152). The *aurar*-convention as it is described in *Baugatal* differs in one fundamental way from the Roman and Merovingian *uncia*-unit. Instead of 6 or 20 gold coins it is to consist of 10 silver pennies. Here we have yet another calibration rule for the production of an øre. According to Brøgger, the earlier Scandinavian øre of the Early and Late Iron Age weighed between c. 26 and 27 g, and the later øre around 24 g. This means that these pennies should weigh some 2.4–2.7 g each. No silver coins that heavy were ever struck in Western Europe between the 8th century and the beginning of the 13th century. The pennies that *Baugatal* was able to refer to, however, which match this weight per coin, were in all likelihood Islamic dirhams, silver coins from the Islamic Caliphate, which began to circulate in large quantities in Scandinavia at the end of the 9th century (Hatz 1974:90; Kilger, this vol. Ch. 7.8). This is yet further evidence that the compensation arrangements in *Baugatal* may go back to the Early Viking Period.

In order to be able to trace the way in which the *aurar* measure was established in Scandinavia, and when, we need to go back to the archaeological evidence in the form of weight-sets and rings, and the numismatic evidence of coins. In the following sections I examine how *aurar* were manifested as the standard in the corpus of weights from Southern Scandinavia and the North Atlantic in the Norwegian Merovingian Period and Viking Age. I shall apply the *aurar* principle to a Viking-period ring hoard from Trøndelag. This metrological survey is an essential basis for approaching the conventions concerning payment which I believe may have been present in Kaupang.

Evidence of weighing practices in the Norwegian Merovingian Period

The few weight-sets of the Early Iron Age known from Norway show that gold was weighed according to units that followed the Merovingian ounce-standard of the Continent. The well-preserved set of weights from Bråten in Ringerike may show us how gold was reckoned in larger and smaller units.[23] The set consists of ten copper-alloy weights. Detailed examination has shown that all of the heavier weights relate to a basic unit of 1.32 g (Tab. 8.4). This unit corresponds approximately to the weight of the reformed Frankish gold tremissis (Steinnes 1927:15). At the end of the 6th century the monetary system of the Merovingian kingdoms was changed with a shift from the Roman siliqua to the Frankish grain-standard (see above, pp. 265–6).[24] It was this monetary development in the Merovingian coin-system that we can see directly reflected in the Bråten weight-set. There is another piece of evidence supporting this. The Frankish and Visigothic coins issued after c. AD 580 made very deliberate use of a new range of symbolism. The Roman goddess Victory was replaced by a free-standing cross (Fig. 8.1; Grierson and Blackburn 1986:92; Grierson 1991:14–15).[25] All of the weights from Bråten that have a punched wheel-cross are correlated by weight with the Frankish tremissis (Fig. 8.9). It is likely that a tremissis marked with the cross was the original reference point for the calibration of the heavier weights in this set at intervals of 20, 40 and 60 units (Nos. 7–9).[26] The remaining weights in the Bråten set respect with minor discrepancies the carat-unit of Roman-Byzantine gold coins (Nos. 1–4) and the grain-unit of Frankish gold coins (Nos. 5–6). The heavier weights from Bråten were used to measure larger quantities of gold in terms of ounces. The much lighter weights were probably

20 The Roman uncia should weigh 27.24 g (6 x 4.54 g). A solidus of 4.54 g is defined by siliquae or carats (24 x 0.189 g). The lighter Frankish uncia that was standardized in the Merovingian kingdom had a nominal weight of 26 g (20 x 1.3 g). The smaller Merovingian tremissis of 1.3 g is defined by barley-grain standard (20 x 0.065 g) (Witthöft 1985:402).

21 The familiar armrings of Hiberno-Norse type seem to respect a modular unit of 26.15 g (Sheehan 1998:178–9). These armrings are dated from the middle of the 9th century to c. 930/940 (Fig. 8.11). The large assemblage of weights from the excavations in Dublin has produced a broadly similar module of 26.6 g (Wallace 1987:206–7). These Irish weight-units correspond to the module of 26.4 g that Brøgger has identified as the early Scandinavian øre (1936:79).

22 Attempts have been made to explain this feature of the Old West Norse linguistic zone — which is, however, also evidenced in Old East Norse — by postulating that when the word was borrowed into Proto-Old Norse there may have been a desire to distinguish between the singular and a distinct plural form (Kock 1911–1916:151). The singular form *eyrir* evolved from a Proto-Old Norse **auriaR,* which in turn derives from Latin *aurius/aureus.* The plural form found in our sources, however, *aurar,* preserves an original Proto-Old Norse **auroR* (Engeler 1991:128–9).

23 C525.

24 Rather than 8 siliquae, a Frankish tremissis weighed 7 siliquae or 20 grains (barley grains) according to the new measure of coin-weight (Grierson 1991:26).

25 Anglo-Saxon gold shillings also make use of the cross-motif when the independent minting of those commences in the second quarter of the 7th century (Grierson 1991:26).

26 In the Anglo-Saxon weight-set from Gilton referred to above, there is one weight that is close to the Merovingian tremissis-standard marked with a punched cross (marked A on Fig. 8.2). This weight weighs 1.27 g (Kyhlberg 1980:164 and 167).

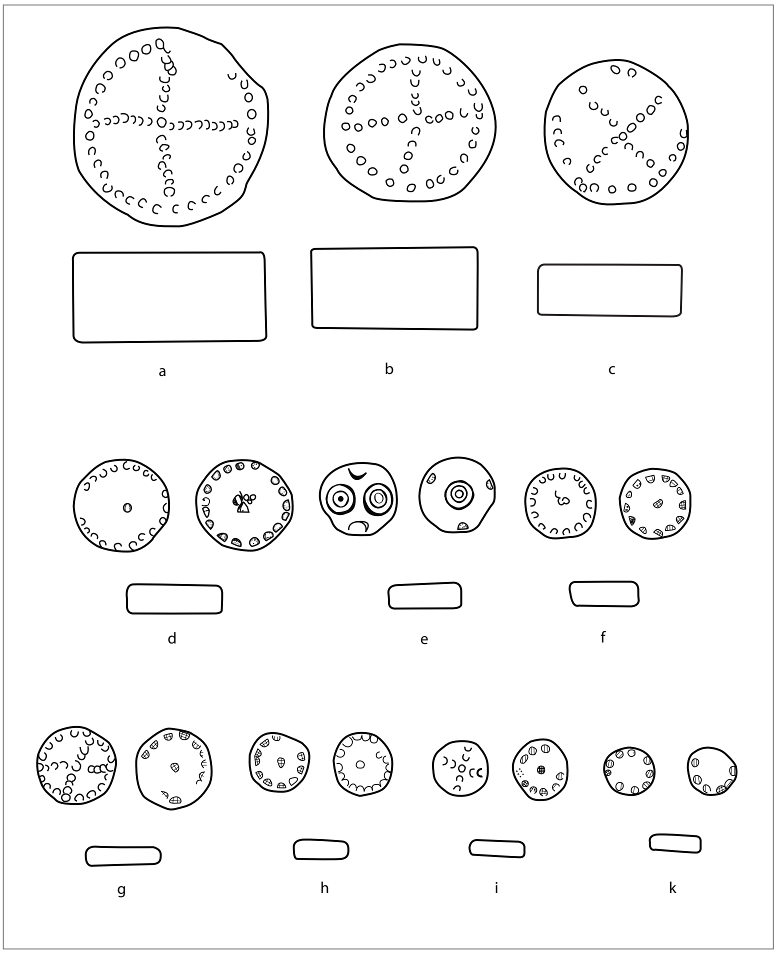


Figure 8.9 *The set of weights from Bråten. After Brøgger 1921:fig. 3.*

Figure 8.10 *Lead and pewter weights from the set from Kiloran Bay, Colonsay, Scotland. Photo, The Trustees of the National Museum of Scotland.*

		Carat/siliqua (á 0.189 g) Roman-Byzantine solidus		
1	0.985 g	0.196 g x 5	dots	
2	2.926 g	0.195 g x 15	”	
3	3.654 g	0.183 g x 20	circles	
4	5.481 g	0.183 g x 30	dots	
		Barleycorn (á 0.065 g) merovingian tremissis		
5	1.327 g	0.067 g x 20	cross	
6	2.626 g	0.066 g x 40	”	
		Merovingian *uncia*	cross	
7	26.319 g	1.315 g x 20	”	1 *eyrir*
8	53.095 g	1.327 g x 40	”	2 *aurar*
9	79.319 g	1.322 g x 60	”	3 *aurar*
		Unit ?		
10	2.227 g			

Table 8.4 *The set of weights from Bråten, Norway. The metric weight-measurements are as given in the first publication from 1832 (Kyhlberg 1980b:168).*

used to calculate and compare the weight of different gold coins with one another.[27]

If we accept Bråten as a representative find, several conclusions follow. To begin with, *aurar* as units of reckoning cannot have been introduced before the end of the 6th century. The introduction of this weight-unit in Scandinavia may perhaps be linked to the custom of precise weighing that is so clearly evident in the grave finds of the Eastern Frankish and Anglo-Saxon lands of the 6th and 7th centuries (Werner 1962:327, fig. 15; Scull 1993). Secondly, the *aurar*-modules correspond to 20 Frankish tremisses (Steinnes 1927:15–16). This vigesimal system is also referred to in several written sources from the early 7th century which describe the exchange rates between coin-units and weight-units.[28] Finally, the *aurar*-module was not based upon Roman denarii as Brøgger (1921:17–23) assumed, but was rather calibrated against the lighter, cross-marked gold coins that were struck in the Germanic kingdoms.

It may be more than mere coincidence that the only gold coin that has been found in Kaupang is a Frisian tremissis struck in Dorestad around the year 650 (Blackburn, this vol. Ch. 3.3.3, Fig. 3.18.b; Rispling et al., this vol. Ch. 4:No. 5). This coin weighs 1.25 g, but since it has a little damage on the edge the original weight may have been a bit more, possibly as much as 1.3 g. The Madelinus coin is unworn, and was probably never in circulation. Up to now, eight examples of Merovingian gold tremisses have been recorded in Southern Scandinavia, seven of which are from Jutland alone (Hatz 1981). The distribution of the finds follows the North Sea coast from the island of Föhr northwards to the Limfjord.The gold tremissis from Kaupang is the only specimen outside of Jutland, and the northernmost found hitherto. In the same way as gold tremisses may represent contacts between Southern Scandinavia and the Mero-

vingian kingdoms in the 6th and 7th centuries (Blackburn, this vol. Ch. 3.3.3, Fig. 3.19), we cannot reject the possibility that they also came to be used as prototypes for calibration in the production of Viking-period weight-sets. Knowledge of the fact that people used gold coins marked with the cross to produce weight-sets according to the *aurar*-standard may have lived on in Kaupang in the 9th century. So it is to the 9th century that we now turn. How were weight-sets of the Early Viking Period calibrated?

Weights with mounts and armrings with a cross

In order to demonstrate the function of coins as calibration models, let us take a closer look at the weight-set from a richly furnished male grave at Kiloran Bay on the island of Colonsay, Western Scotland (Fig. 8.10; Grieg 1940:46–60). This contained both lead and tin weights with metal mounts that are very common in Norwegian Viking-period finds and in the areas of Scandinavian settlement around the North Sea. The weight-types from Colonsay show the typical application of metal mounts on the surface of the object. Similar weights have been found at Kaupang (Pedersen, this vol. Ch. 6.4.4). At Kiloran Bay there were also two weights with imitation writing reminding one of Arabic lettering, while the smallest weight is a knob from a penannular brooch of Finnish type (Kyhlberg 1980b:173). The grave also contained three Northumbrian styccas, one of which was struck in York under Archbishop Wigmund, who held this office from 831–854 (Brøgger 1921:79; Grieg 1940: 58–9). The grave is therefore to be dated to the second half of the 9th century, which is consistent with the other artefacts it contained.

The weights from Colonsay seem to be calibrated according to a simple scheme of reckoning that corresponds to approximately 10, 20, 30, 40, 50, 60 and 100 units of a coin module between c. 1.24 and 1.31 g (Tab. 8.5). The brooch-knob that is the smallest weight, weighs 12.94 g, which may mean that a coin weighing c. 1.29 g was used as the minimum building block (Kyhlberg 1980b:154).[29] This set, very probably, does not display the original precision that was aimed at when weight-sets were produced.[30] My point here, however, is that a coin was used in the production of these weight-sets, for which reason it was impossible to produce absolutely equal weight-sets. All sets of

27 Only weight no. 10 cannot be related to reckoning in terms of gold coin.

28 The earliest Anglo-Saxon law-code which was formulated under King Æthelberht of Kent in the year 603 specifies that the gold-unit – the shilling – consists of 20 sceattas (Grierson and Blackburn 1986:15). The Visigothic bishop Isidore of Seville states in his Encyclopedia, probably written in the 620s, that the exchange rate amongst the Gauls between the ounce and the denar was supposed to be 1:20 (Brøgger 1921:96–7; Kyhlberg 1980:153).

29 The weights had been produced at regular intervals based upon a module of c. 12.94–12.96 g (Kyhlberg 1980:173). The brooch-knob was probably used to calibrate the remaining weights. Kyhlberg has suggested that the brooch-knob exactly represents the weight of 200 grains at the Merovingian grain-standard.

30 The deviations from the basic module of 12.94 g in weight nos. 3 and 4, 1.7 and 2.2 g respectively, amount to c. 4.5%. This margin of error was presumably acceptable in the Viking Period when larger quantities of silver were being weighed (Sperber 1996:115–17, fig. 3.5; Steuer 1997:116).

weights are individual. The specific *aurar*-module in each weight-set could fluctuate by a tenth of a gram depending on how much the coin weighed, and what sort of coin had been used: in other words, what conventions were in force when the set of weights was produced.

The same types of weights with gilt metal appliqués as those from Colonsay are found all around the North Sea in the Viking Period, from Norway in the East to Ireland in the West. The principal area of distribution in Norway is along the western coast where such items are primarily found as grave goods (Pedersen, this vol. Ch. 6.4.4, Fig. 6.41). In this connexion we should also note that silver armrings, which first appear during the 9th century in the North Sea zone, seem to have been adjusted by weight to the *aurar*-unit. Amongst the most typical Viking-period armrings in Norway are what are known as decorated Hiberno-Norse broadband armrings (Sheehan 1998: 177–81), which usually have punched transverse strips and a cross (Fig. 8.11). The distribution of these is largely limited to Ireland, the Viken area, and the North Sea coast of Norway. John Sheehan (1998:178) dates the active period of production and use of broadband armrings to c. 850–930/40. As Patrick Wallace has pointed out, this type of ring and the weights from Dublin respect approximately the same weight-standard. The usual Hiberno-Norse armrings follow a weight module of around 26.15 g (Sheehan 1998:178–9), and the weights centre around 26.6 g (Wallace 1987:206–7 and 212). These correspond to multiples of twenty of a coin-weight at 1.3 and 1.33 g respectively. That is slightly heavier than the coin-unit that was found in the weight-set from Kiloran Bay, Colonsay.

On the Hiberno-Norse armrings the cross symbol is conspicuous (Fig. 8.11). The cross need not be understood exclusively as a Christian symbol but may also indicate that the rings were standardized by weight in relation to a coin marked with a cross. It is possible that Anglo-Saxon pennies carrying the cross from the first half of the 9th century will have been used as the calibration prototypes.[31] But the weight of pennies was not as finely maintained as that of the Merovingian gold coins (see above, p. 269). Two pennies marked with the cross struck for Coenwulf of Mercia in the early 9th century have been found in Kaupang (Blackburn, this vol. Ch. 3.1.1 and 3.3.2, Fig. 3.17.a; Rispling et al., this vol. Ch. 4:Nos. 9–10). Rather than pennies, it was first and foremost gold coins carrying the cross, such as the Merovingian tremisses, that maintained a very consistent weight. People were presumably still aware of this in the early Viking Period when weight-sets had to be made. The 7th-century Frisian gold tremissis from Kaupang could therefore be interpreted as a calibration coin for a silversmith whose workshop was in the town. Only one coin was needed to produce a complete set of weights.

		coin-weight		*aurar*
1	12.94 g	1.29	x 10	½
2	25.11 g	1.25	x 20	1
3	37.11 g	1.24	x 30	1 ½
4	49.56 g	1.24	x 40	2
5	65.73 g	1.31	x 50	2 ½
6	77.32 g	1.28	x 60	3
7	129.30 g	1.29	x 100	5

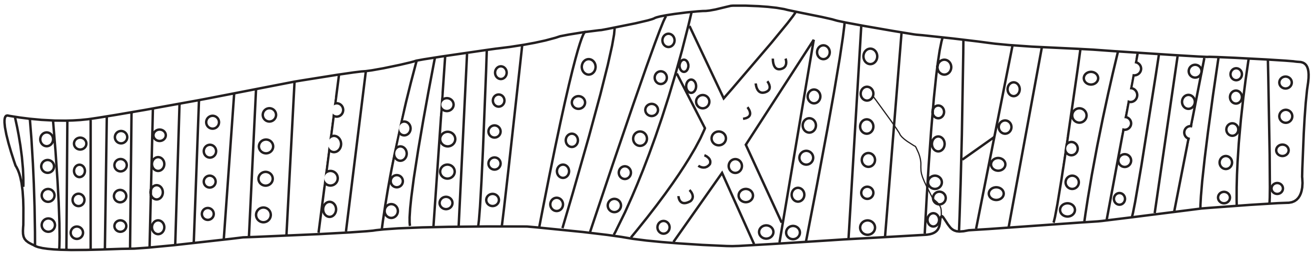
Table 8.5 *The set of weights from Kildoran Bay, Colonsay, Scotland (Kyhlberg 1980b:173).*

Looking for *aurar* in ring hoards

Metrological analysis of the weight-set from Kiloran Bay, Colonsay, shows that precious metals were handled in larger quantities in accordance with the *aurar*-reckoning. The heaviest weight in the set weighed around 129 g, which corresponds to about 5 øre reckoned by a module of 25.8 g. But there is evidence for even heavier weights, such as one well-preserved specimen with an Insular mount from Berg, Hurum, South-Eastern Norway.[32] This weighs 294.8 g, corresponding to 11 øre at a module of 26.8 g (Pedersen 2000:76–7, this vol. Ch. 6.4.4, Fig. 6.41.a). In her study of the Kaupang finds, Unn Pedersen argues that the Viking-period weights with gold inlays or gilt appliqués may have been used in weighing gold (this vol. Ch. 6.4.4). This is highly plausible, although the association with gold may also allude to a higher level and more abstract level, namely that the gold-mounted weights establish an association with the coined gold-based *aurar*-standard. More than anything else it is the Viking-period gold neckrings that seem to have been calibrated to that standard (Brøgger 1921: 40; Skovmand 1942:72; Hårdh 1996: 160–1). As an example we can take the gold neckrings from the Hoen hoard (Graham-Campbell 1999:64) or the largest Viking-period gold hoard that was found in Sweden on the island of Grönsö near Birka. The Grönsö hoard consisted of two massive gold armrings linked together by a gold peg (Zachrisson 1998: 238–9). Altogether the hoard weighed 528.7 g, corresponding to exactly 20 øre at a module of 26.4 g (Kyhlberg 1980b:156). It thus seems reasonable to infer that the large lead weights may have been used for weighing gold rings.

But the question arises whether or not the *aurar*-standard was also used for weighing and calculating silver rings? In the case of the armrings of the Hiberno-Norse type, referred to above, or the Oriental spiral-twisted Permian neckrings, there seems to be a consensus that these were standardized by weight (Munksgaard 1963:101–4; Lundström 1973:76–7;

Figure 8.11 *Armring of Hiberno-Norse type. Slemmedal, Aust-Agder C36000 (t.p.q. 914). (Blindheim 1982:18, fig. 12).*



Sheehan 1998:178–9). In the case of other groups of Viking-period neckrings, however, any such standardization is less easy to detect in comparative metrological studies, and thus less probable. However it is not proper to exclude the possibility that different regional scales of calibration may have existed, as Hårdh has indicated (1996:59–65). We shall now take a closer look at the so-called plaited and multi-rod neckrings that start to turn up in hoards at the end of the 9th century and are amongst the largest types of silver ring of the Viking Period (Fig. 8.12; Graham-Campbell 1999).[33] This type of neckring is very common in Norwegian hoards where it is usually deposited with no associated coins. It is only in hacksilver finds that coins and rings appear together. The plaited neckrings are also represented all around the Baltic Sea zone and in most regions of Scandinavia (Hårdh 1996:42–3, fig. 2).[34] Fragments of rods for plaited arm- or neckrings have also been found amongst the material from Kaupang (Hårdh, this vol. Ch. 5.8, Fig. 5.14). Analyses of the finds indicate that the multi-rod neckrings may have been manufactured in the same region they were deposited in (Hårdh 1996:76). Birgitta Hårdh argues that the rings may have had a short period of use in Norway, from the end of the 9th century into the 10th (1996:67–8). Further east this type of ring may be considerably later; as in Finland and the Baltic states, where it is dated to the 12th and 13th centuries (Hårdh 1996: 80–1; Spangen 2005:41).

In contrast to the spiral-twisted neckrings of Oriental type such as those known as Permian rings, the multi-rod neckrings do not really constitute an equivalent corpus of carefully weighed items. There are indications, however, that even these may have been calibrated according to specific units of weight. As Hårdh (1996:59–60) points out, several rings from single hoards seem to have been weighed to an approximately common module. To be able to detect this, we need to convert weights in grams to coin-units. I shall demonstrate this using the neckrings from Vulu, Malvik, near Trondheim (Fig. 8.12; Hårdh 1996:195–6). These neckrings appear to have been weighed in terms of two different *aurar*-modules. The heaviest rings may have been weighed in terms of a module of c. 25.69 g at 11 and 22 øre. In this case a set of weights that were calibrated against a coin of 1.28 g may have been used. The other four silver rings were weighed almost exactly, but had been calibrated according to a slightly heavier *aurar*-module between c. 26.23 and 26.47 g (Tab. 8.6). Beyond this there seems also to have been reckoning in half-øre. The occurrence of half-øre weights can also be observed in the weight-sets from Bråten and Colonsay (Tabs. 8.4–5).

The hoard from Vulu is but one, as yet, of a few cases of ring hoards in which the *aurar*-module can be so clearly found. A survey of Birgitta Hårdh's catalogue of other Norwegian hoards containing silver neckrings does not produce the same results in terms of calibration (Hårdh 1996:192–6). This may indicate that the rings circulated through several different stages and were mixed together before ending up in a particular hoard. In such circumstances a common *aurar*-module becomes harder to distinguish. A clear pattern of calibration seems to emerge only when the ring hoards contain several specimens that had been

31 The weight-standard of Anglo-Saxon pennies apparently observed the Troy grain-unit. The weight of the penny rose successively from 18 to 21 grains in the period from c. 760/70 to 880; i.e. from 1.17 to 1.36 g (Grierson and Blackburn 1986:270, cat. nos. 584–8, pls. 53–4).

32 Copenhagen CM XXX–XXXII.

33 Typical of this type of ring is that it consists of at least two or more rods which are twisted together or plaited. The ring could be fastened with the help of hooks and eyes. The fastening mechanisms show great variation in form but appear to be standardized (Hårdh 1996:45, fig. 4). The fastening mechanisms have been used to create a regional subclassification of this otherwise highly uniform type (Hårdh 1996:45–53, 78–83, fig. 19).

34 Concentrations of this type of ring in hoards are found particularly in Vestfold, Agder, South-Western Norway, Trøndelag and North Norway (Hårdh 1996:figs. 2 and 16).

manufactured in one workshop using the same weighing equipment. What Vulu may also be an example of is that the absolute value of the *aurar*-module in grams was governed by the weight of the coin that was used to calibrate the set of weights. The standardization of rings by weight is consequently difficult to confirm if one only uses the modern metric scale in studying them. In other words, metrological analyses of both weight-sets and rings need a methodology that is able to reveal the pattern of calibration at the foundations of coin-based *aurar* reckoning. Nonetheless it emerges clearly that the silver rings do not represent the same clear pattern of calibration as the gold rings. On the other hand it is inappropriate to exclude the possibility that the silver rings were also regarded, in their original circumstances, as being of standard weights. As I shall show later, the weight of any particular ring could be deliberately changed after it left the workshop. In written sources the silver ring is described in its character as the payment ring at the *thing* as a "public" object *(Grágás,* trans. Dennis et al. 1980:175). The weight of the ring could be increased by attaching further silver rings to it, or it could be divided into smaller portions after it had publicly been handed over to the party to the case (below, pp. 315–16). But the great variation in weight amongst the Scandinavian silver rings may have yet another cause, namely the existence of yet another tradition of calibration using coin, which was apparently found alongside the *aurar* standard. This is what we shall examine in the following section.

silver neckrings		*aurar*-module		coin-unit	*aurar*
1.	158.34 g	26.39	x 6	1.32 x 120	6
2.	211.8 g	26.47	x 8	1.32 x 160	8
3.	236.64 g	26.29	x 9	1.31 x 180	9
4.	327.99 g	26.23	x 12.5	1.31 x 250	12½
5.	282.43 g	25.69	x 11	1.28 x 220	11
6.	566 g	25.69	x 22	1.28 x 420	22

Table 8.6 *Plaited silver neckrings, Vulu, Malvik, Trøndelag (Hårdh 1996:195–6).*

Dirhams as weights, and *grivnas*

At the end of the 9th century a new group of silver coins began to dominate the circulation of silver throughout Scandinavia. These were the Islamic dirhams, which had the same impact in terms of establishing confidence in the weighing and valuing of silver as the Western coins marked with the cross. The dirham formed part of a system of reckoning that followed a different tradition of calibration than that of the Merovingian gold tremisses and Anglo-Saxon silver pennies. Like the gold tremisses these were very consistent in weight, and in the Caliphate state coin-weights made of glass were used to check the weights of the dirhams (Fig. 8.15; Balog 1976, 1980). In the Icelandic *Baugatal* already referred to, it is stated that 10 pennies make up 1 *eyrir* (see above, p. 283). This really can only refer to the heavier silver dirhams which may have been used as coins for calibration. But was there really another system of reckoning

Figure 8.12. *Silver neckrings: plaited with triangular terminals. Vulu, Malvik, Sør-Trøndelag. Hårdh type 3. Photo, Birgitta Hårdh.*

alongside the *aurar*-system for weighing silver in larger and well-proportioned units during the Viking Period? Can we find archaeological evidence of this possibly Eastern coin-based method of reckoning and valuation? In my opinion there are several pieces of evidence for this.

In the harbour basin at Hedeby, immediately adjacent to the wharves, 9 die-identical Abbasid dirhams struck in the year 807/8 in Baghdad under Caliph Harun al-Rashid were found in 1980. These were not made of pure silver but were rather made in a tin-lead alloy. Traces of a casting sprue around the end – in the same place on five of these coins – show that a single coin had been used as the model. These, then, are copies of a single Abbasid dirham (Steuer 2002: 155–7). That all these copies are identical and come from the same stratigraphical context also shows that they were made, and perhaps also used, in Hedeby. A number of scholars have considered these copies to be forgeries (Steuer 2002:158–9; Gustin 2004c:172–3). There are several cases of coin-forgery in other Viking-period finds (Gustin 2004c:173). The purpose of the Hedeby copies was doubtless fraudulent, to pretend that these were genuine dirhams. But in my view, pseudo-dirhams are not forged coins in a monetary sense. The pewter dirhams were probably not used as currency in Hedeby. The attempt to deceive may have been enacted in a quite different way.

During the same excavations that uncovered these copies, five genuine dirhams were found.[35] These included an early, complete Abbasid dirham struck in the year 803/4 under Harun al-Rashid in Baghdad, three Samanid dirhams struck at the beginning of the 10th century, two of which were in fragments, and one unidentified coin-fragment. It is not immediately apparent from the preliminary account of the finds how close these coins lay to one another in their stratigraphical contexts. It is, however, entirely reasonable to assume that the nine copies were lost together by the wharf on a particular occasion (Steuer 2002:158).[36] I believe that this circumstance offers a fine opportunity to see how silver was handled in the Viking Period. Rather than nine different forged coins there could have been a complete set of weights which originally consisted of ten pieces. In that case the set would fulfil the requirements of *Baugatal,* in which 10 pennies would make 1 *eyrir* (see above, pp. 282–3). Just like the gold tremissis, so too the dirham could, in the Viking Period, have been regarded as a guarantee of value when weighing. The early Abbasid dirhams down to the reign of Harun al-Rashid are very consistent in weight.[37] But the trust enjoyed by dirhams as markers of quality was abused in this case. The average weight of the Hedeby copies is much lighter than genuine dirhams, 2.29 g rather than the current norm in the Caliphate between c. 2.7 and 2.9 g (Welin 1958). Altogether, the copies weigh 20.57 g. But what has become of the tenth coin?

It is difficult to decide whether or not the genuine and complete coins such as the early Abbasid dirham or one of the Samanid specimens was part of the set originally. The Abbasid dirham was not found in its original stratigraphical context but only later during sieving. Interestingly enough, this coin too, like the copies, is much lighter, weighing only 2.26 g, which is very unusual. If this coin was part of the original assemblage the whole set would only have weighted 22.83 g. The Samanid dirham that is the other possible candidate was struck in the year 894/5 in Shash. According to the preliminary publication of the find it was found together with a fragment in approximately the same area as the copies (Wiechmann, in prep.). This coin, which weighs 4.0 g, belongs to a later phase in coin-production in the Caliphate, when the average weight of the dirham was heavier and less consistent than with earlier Abbasid issues.[38] If we add this coin to the copies the whole set comes to weigh 24.57 g. If, then, the pseudo-coins from Hedeby are an example of deceit, the nature of the

35 My thanks to Dr Ralf Wiechmann who has kindly supplied me with a list of coins, with information on weight and context, for my use. This list of finds will be included in his forthcoming publication discussing the use of coin in Hedeby (Wiechmann, in prep.).

36 However even the copies do not appear to have lain in a single group but rather were spread through more than one layer (layers III–IV) and grid-unit (G42–44 and D26–28: Wiechmann, in prep.). Coins which may originally have lain together, for instance in a purse, can later be dispersed over a wider area. Supporting this is the fact that the objects had lain both in water and silt for a long period of time, and were subject to wave-movement.

37 See below, note 39.

38 See below, note 39.

Figure 8.13 *Abbasid dirham. Caliph Harun al-Rashid. 786–809. Madinat al-Salam 193 (808/9). 2.8 g. From Stora Velinge I (1936), Gotland. Private ownership. Scale 3:1. Photo, Kenneth Jonsson, Stockholm University.*

fraud lay rather in pretending there was a larger quantity of silver on the scales than was actually there. The quantity of silver that the other party would have expected should have weighed something between 27 and 29 g, which would correspond to the weight of ten complete dirhams if we work from the earlier Abbasid dirham standard.

That it apparently was the practice at larger trading sites to use the dirhams themselves as weights in weighing silver in larger quantities is also shown by the latest coin finds from Kaupang. The majority of the 92 dirhams from Kaupang are cut or broken coins. Amongst these, however, there are eight early Abbasid dirhams that are whole (Rispling et al., this vol. Ch. 4:Nos. 23, 26, 32, 37, 38, 39, 40 and 44). Four of these were apparently perforated or folded and so are excluded (Tab. 8.7).

As in the set from Hedeby, the coins from Kaupang were struck under the early Abbasid caliphs, principally in the reign of Harun al-Rashid (786–809) in Madinat al-Salam and al-Muhammadiyya, nowadays Baghdad and Tehran. Like the Merovingian gold tremisses, the dirhams derive from a strictly regulated monetary system, and the weight of the coins was of immense importance in the economic system of the Caliphate. The weight of both the gold dinars and the dirhams was checked by means of *exagia:* state control weights (see below, pp. 302–3; Fig. 8.15). It was possible to check the weight of individual coins to a very fine degree (Steuer 1978:257). The Arabic coin-weights were made of glass, and later also of brass (Balog 1976). The average weight of dirhams changed a little in the course of the Viking Period while at the same time different regional weight-standards were employed within the Caliphate.[39]

It is possible that the monetary situation within the Caliphate is also reflected in the use of dirhams as coin-weights in Hedeby and Kaupang. It is only dirhams that maintain a consistent weight and which respect Caliph Abd al-Malik's original weight-standard that were certainly used in this way. Obviously people could not read the texts on the coins, but the early Abbasid dirhams, down to the end of Harun al-Rashid's issues, were easily recognized. All of them have ring symbols or annulets in the outer ring on the coin-face (Fig. 8.13). These annulets can still be traced early in the reign of Caliph al-Mamun (813-833). They are depicted on dirhams which were minted until the Hijrah date 204, which means the years 819/820. After that they disappear as an element of decoration (e.g. Leimus 2007:pls. 21-23).

The reason why it was specifically Harun al-Rashid's dirhams from Baghdad and Tehran that were selected as coin-weights is also that they are amongst the most common 9th-century dirhams in Scandinavian finds. Other than the Hedeby copies, and texts such as *Baugatal,* we have no concrete evidence of this method of valuation. Dirhams were probably not used to calibrate the Western, Viking-period weights of lead or pewter with appliqués. This

23.	al-Mahdi	Madinat al-Salam	779/780	2.33 g	corroded
38.	Harun al-Rashid	Madinat al-Salam	804/05	2.30 g	damaged
39.	Harun al-Rashid	al-Muhammadiyya	804/05	2.83 g	
40.	Harun al-Rashid	al-Muhammadiyya	804/05	2.49 g	corroded

Table 8.7 *Whole dirhams from Kaupang (Rispling et al., this vol. Ch. 4).*

obviously cannot be entirely ruled out until a greater number of such weights have been examined in light of this question. Patrick Wallace's investigations (1987:212) of the finds from Dublin show at least that the Western weights remain on the whole approximately centred on the earlier *aurar*-module of c. 26.6 g. The same basic unit was also observed by Brøgger (1921:80) in his study of the lead weights with metal mounts in Norwegian finds.

When dirhams start to predominate in the silver in circulation in the last quarter of the 9th century, as was the case at Kaupang (Kilger, this vol. Ch. 7.9), yet one further practice for reckoning and valuing a quantity of silver besides the Western *aurar* weight-sets apparently came into use. The coins themselves were used as the means of valuation. The dirhams were then the smallest unit for the production of silver rings to standardized weights. Here we may see an Eastern European tradition of calibration according to which silver was reckoned in bigger units (Hårdh 2007). This is probably reflected in the Arab envoy Ibn Fadlan's account of his meeting with Russian merchants in the 920s at the Volga Bulgars' capital of Bulgar. The Russian traders earned large sums in dirhams which they converted into neckrings and gave as gifts to their wives.[40] A neckring was produced every time the merchant had earned a sum of 10,000 dirhams; two rings from a sum of 20,000 coins; etc (Montgomery 2000:6–7). However no information is provided on how many dirhams were included in each ring. What is interesting is that the multiple of 10 appears here as a fixed unit of quantity in terms of which people counted the number of dirhams they had made.

This Eastern ring tradition was probably the basis of the Russian weight-unit *grivna,* which etymologically has its roots in the Slavonic languages and can be translated as "ring" (Hårdh 2007:141–2). The *grivna* is an Eastern European counterpart to the Scandinavian ring *baugr* (Pritsak 1998:41).[41] The *grivna,* like the *baugr,* was a symbol of personal wealth and eminence, characterizing its possessor. With the Eastern tradition in which the dirhams themselves were used as calibration prototypes and in which people apparently began to calculate the øre in terms of ten coins, the *aurar* weight-unit was raised from c. 26.5 g to a value between 27 and 29 g. In certain cases, such as the clump of melted dirhams from Kaupang (Blackburn, this vol. Ch. 3.1.2, Fig. 3.1), we cannot entirely exclude a value around 30 g. The clump of coins that was found in Kaupang consisted of dirham-fragments and weighed 29.81 g (Blackburn, this vol. Ch. 3; Rispling et al., this vol. Ch. 4:No. 102). Taking dirhams not only as prototypes for calibration but as representing, at the same time, an Eastern calibration tradition, we establish a way of understanding the variation in weights in the corpus of Scandinavian rings.[42]

Examination of the weight-sets from Bråten and Colonsay, the dirham finds from Hedeby and Kaupang, and the ring hoard from Vulu, has yielded indications of the existence of two forms of calibration in Scandinavia during the Viking Period in which coins were used as the calibration prototypes: on one side the *aurar*-standard and on the other the Eastern, dirham-based, *grivna*-standard. The *aurar*-standard had apparently been employed since the Norwegian Merovingian Period to weigh gold in exactly equal portions; later, in the Viking Period, for weighing silver too. I have also argued for the conceptual and metrological linkage of objects of standardized weights, such as rings, weights and coins. The handling of precious metals was thus calculable and subject to reckoning in the same way as coins were in monetized societies. Thus *aurar*-objects fulfilled the same essential requirement that is definitive of the position of money as a standardized form of currency. But why were aurar-objects regarded as of value? Why were they accepted as media of value and valuation in societies that had no strong central authority? In order to be able to answer these questions, we need to look more closely at the gold ring and how it has been described in Old Norse mythology.

39 Exagia, which were introduced with every change of ruler, reflect both these changes and the regional variation in the weight of the dirham. Up to around the 830s, when the earlier Abbasid period of minting ends, the dirham weighed on average 2.7–2.9 g. An analysis of Umayyad and early Abbasid glass weights has yielded a value between 2.72 and 2.82 g (Welin 1958:510; Fig. 8.15). After c. 833 a new phase of Abbasid coining began. The quality of minting deteriorated visibly and the weight of the dirhams became less consistent (Miles 1965:319). In the 10th century dirhams can weigh up to about 3 g. This is also consistent with the weight of Fatimid glass exagia from Egypt of this period (Welin 1958:510).

40 James E. Montgomery's translation, which attempts to keep as close as possible to the expressions of the original text, refers to necklaces rather than neckrings.

41 The word grivna was subsequently used in 12th-century Russia for ingots of normalized weight, e.g. the Kiev grivna and Novgorod grivna (Melnikova 1996:68–72).

42 I have not discussed the manifest standardization by weight of the Oriental spiral-twisted neckrings of the Permian and Duesminde types. The basic module for these rings of 25–26 g is a little lighter than the aurar-module. It is possible that North African dirhams struck in the 8th century served as the calibration prototypes for this type of ring (Kilger, this vol. Ch. 7.3). In Egypt, a lower standard weight was employed for dirhams than in the rest of the Caliphate (Miles 1965:319–20). A grivna-unit of c. 25 g could be produced using 10 North African dirhams. North African dirhams are very common in Russian finds from the first quarter of the 9th century (Kilger, this vol. Ch. 7.4, Tab. 7.6). This matches the period in which the spiral-twisted neckrings began to circulate in the Baltic area (Kilger, this vol. Ch. 7.4, Fig. 7.11).

Odin's inalienable property: the stable and eternal gold ring

Just like coins in Christian kingdoms, the ring, the most prominent of the *aurar*-objects, was imbued with transcendental and sacred associations so that it became a symbol of standards and value. The concept of value can only be made concrete by being embodied within an object that can be laden with stories and ideas. In Snorri's *Edda* the gold ring is referred to as a sacred symbol of Norse mythology. Snorri here may provide us with a key that enables us to understand the ring as an object of value in the Northern world of ideas. In *Skáldskaparmál,* Snorri wrote that the dwarf Brokk made a gold ring called Draupnir which he gave as a gift to Odin (trans. Byock 2005:92–3). Draupnir has a special characteristic. Every ninth night the ring increases to a total of eight rings, all of the same weight.This uniformity of weight is expressed by the word *iafnhöfgir,* which appears both in the eddic poem *Skírnismál* and in *Skáldskaparmál* as a poetic way of stating that the rings which dripped off Draupnir were absolutely equal. The number of eight, which is also recorded in another context, is of interest from the viewpoint of the history of weights. This was the relationship between øre and the Scandinavian mark. A mark was always reckoned as 8 øre. This canonical relationship is recorded as early as the agreement between Guthrum and Alfred that established the Danelaw in the late 9th century (Attenborough 1922:103–9). Draupnir ought, then, to be regarded as a mythological representation of the mark as a weight-unit made up of eight parts of equal weight.

Draupnir is a symbol of the power of creation and rejuvenation. It has the quality of reproducing itself at the same weight. In Odin's hands it embodies an eternal status quo, an inexhaustible power of reproduction which always produces the same result. The same idea is also at the root of the weighing of precious metal: namely the ability to create exactly equal portions. In addition to the fertility symbolism latent in the ring's rejuvenating power that a number of scholars have identified (Steinsland 1991:149–51), I believe that this "eternal" gold ring also represents the idea of predictability. The carefully weighed gold ring respecting the *aurar*-standard can thus also be seen as a symbol of rectitude. At the same time, *aurar*-objects such as rings can be quantified and so, just like coins, can be dealt with according to an abstract scale of reckoning. The quantifiability of the ring is furthermore an essential prerequisite for the maintenance of social order in the community. Both documentary sources and archaeological evidence reveal the ring to have been a legal object that oaths were sworn upon and compensation paid in (Brink 1996). It was the all-embracing idea of a divinely sanctioned justice that delivered the sense of security and confidence which is at the bottom of all forms of exchange trade. It was these general and immaterial associations of value – justice and predictability – that hover over the *aurar*-ring and invest it with an aura of inalienability and so of value. It is also the gold ring that is generally referred to in skaldic poetry, as the kings' most valuable possession that could only be given as a gift to others. However even this invaluable quality had a price put upon it in the Viking Period. The weight of gold rings is often given in the texts in marks (Engeler 1991:125–6). This is also implied by the fact that in Anglo-Saxon documentary sources concerning the Danelaw, such as the treaty of Alfred and Guthrum, marks are given in gold (Engeler 1991:115).

By means of the gold ring, Odin introduced an order of justice. The gold ring was sacred in character to the highest degree, and could not be sold under any circumstances. It belonged to the gods, not to men. This is reflected in the fact that gold was often interred in wetlands and close to water (Hårdh 1996: 134; Zachrisson 1998:117–18). Gold rings are practically never found in normal silver hoards except in special assemblages with outstanding artefacts that relate to the feminine sphere. A very typical example of these "female hoards" is the gold treasure from Hoen, about two days' journey from Kaupang (Kilger 2008). This also contained other objects of unambiguously feminine character, such as glass beads, pendants, and a gold trefoil brooch (Fuglesang 2005: 174–6). The gold rings were not meant for this world and were kept out of circulation. It was through its association with the god Odin that the *aurar*-ring was invested with mythical capital. The divine and carefully proportioned gold ring was the absolute and essential point of reference for the system of value and payment of the Viking Period. It thus imbued *aurar*-objects in silver such as rings and ingots with the necessary associations of value so that they could assume a function as "money". The significance of the ring as a calculable object of value was thus rooted in the world of the gods. The gold ring was the Viking Period's supreme *inalienable possession.*

That Draupnir produced eight further rings of equal weights every ninth night was probably no random detail. Eight was regarded as a sacred number in the Norse conceptual world. It was probably the Old Norse *átt* that is at the root of the number eight. *Átt* is the term for the eighth part of the horizon that the sun passes in the course of three hours. Thus the horizon was considered to be constituted of eight equal parts or subdivisions, *áttir,* each of which had its own name (Cleasby et al. 1874:47). The older futhark also consisted of three *ættir,* with eight runes in each (Antonsen 2002:43). But the number eight is also used as a relative quantity to define the value of pure silver according to Icelandic law codes (Naumann 1987:377) (below, p. 297).

The number eight refers to absolute and unchanging phenomena in nature such as the course of the sun in the sky, and to the sacred order in the rune-row, which itself embodied secret knowledge. As an eternal and mythical figure, eight also fulfilled an essential function in the economic sphere. Using this as an absolute number of account, the division of wholeness into eight equal parts created a divinely rooted matrix of counting with which one could reckon the value of various goods in relation to one another. It was Odin's gold ring as the inalienable possession of Viking society that guarded and guaranteed this economic order. The absolute completeness consisting of eight parts was employed to define the value of pure and good silver, and thus the fundamental significance of silver as "money" in the circulation of goods. However one important question remains to be answered in this section: if it developed in the Early Iron Age in Scandinavia, how could the *aurar*-system have been passed on to the Viking Period and so into Kaupang? To answer that, we have to examine what factors may have led to the establishment of reckoning in *aurar* in Scandinavia. To do so, we need to turn back to Brøgger's øre theory and his conclusions.

"Aurar-sites" in Southern Scandinavia

Bråten was one of the few sets of weights of the Early Iron Age that Brøgger was able to refer to in his case for the øre-standard having an ancient origin and thus to be datable to the Roman Iron Age (Brøgger 1921:12–16). He assumed that denarii of the Roman Republic had been used to calibrate the weights (1921: 17–23). The earlier Scandinavia øre had, according to Brøgger, its immediate prototype in the Roman ounce of about 27 g. However it was the Norwegian historian Asgaut Steinnes (1927) who, on metrological grounds, was able conclusively to refute Brøgger's theory. Steinnes (1927:15–17) showed, using the evidence of Bråten amongst others, that it was not the Early Roman but the Merovingian ounce that had been the model for the øre-weight. Brøgger (1936:77 and 81) was acquainted with Steinnes's work but did not change his view. Brøgger's longer Roman chronology for the øre-weight remained unchallenged in later scholarship (e.g. Bakka 1978). In analyses of gold finds such as the rings, the Roman ounce has been automatically associated with the Scandinavian øre (e.g. Munksgaard 1980).

By locating the introduction of *aurar*-reckoning in the Norwegian Merovingian Period, however, we also change the basis for understanding why standardized sets of weights such as that from Bråten are found in Southern Scandinavia. With a shorter chronology, the phenomenon is placed in a different archaeological and cultural context. With a redating to the Merovingian Period, we find ourselves in the post-Roman world and at the beginning of a new epoch, with new economic constellations (Lebecq 2005). This is the period in which trade expanded in the North Sea region and the urban settlements known as wics were founded all around the North Sea coasts under the control of petty kings (Hodges 2000:77). Initially, it was Frankish, Byzantine and Anglo-Saxon gold coins that first circulated around this trading network; then, at the end of the 7th and in the 8th centuries, the silver coins known as sceattas (Grierson and Blackburn 1986:155–89). The question is, then, whether or not the same period saw the introduction of a uniform standard of reckoning in those areas that were manifestly participants in this system of exchange but were unwilling to accept coins as a standard form of payment. The burgeoning North Sea trading network may have provided the requisite conditions for the establishment of common conventions and rules for the comparison and valuation of goods being exchanged. With the idea of øre, we may see the outlines of a system of valuation that made it possible to buy and sell goods at seasonal sites which also produce evidence of craft and trade, particularly in Southern Scandinavia.

Such a site may have been Gudme/Lundeborg on the island of Fyn. At the coastal settlement site of Lundeborg, which was established sometime in the 3rd century AD, a complete set of seven bronze weights has been found on which the cross-symbol is as conspicuous as in the find from Bråten (Fig. 8.9; Thomsen 1993:96–7). Detailed metrological studies of the weight-set have yet to be undertaken, but it is reasonable to assume that this find belongs to the Norwegian Merovingian Period, and to the 7th century. The Gudme/Lundeborg complex is also well known for its finds of gold rings of standardized weights from the same period. At the farm of Broholm in the immediate neighbourhood of Gudme one of the largest gold hoards from Denmark was found. The Broholm treasure consisted of various kinds of gold ring and gold bracteate, together with silver ingots containing some gold (Fig. 8.14). According to Brøgger (1921:31), who undertook a metrological study of Broholm, the gold rings respect the øre-weight within a range between c. 26 and 27.2 g. The ring-weights fall at intervals of 50, 30, 20 and 2 øre. There is also a gold capsule which Brøgger interpreted as a weight at 26.1 g. The case I made above implies that the method of reckoning in øre was not introduced before the Norwegian Merovingian Period (see above, pp. 280–2). The Broholm hoard contains gold objects weighed according the øre-unit and should therefore be dated no earlier than the 7th century, despite the fact that the hoard also contains Migration-period gold bracteates.

Although the seasonal activities at Lundeborg apparently diminished in the 5th century after the fall of the Roman Empire, they carried on to the beginning of the 8th century (Thomsen et al. 1993:97; Thrane 1993:17–20). Further continuity in settlement in the area into the Viking Period is evident at

Figure 8.14 *The Broholm treasure, Gudme. Photo, Kit Weiss, National Museum of Denmark.*

Gudme. It is shown by remains of buildings and finds of weights, neckrings, sceattas and dirhams (Thrane 1993:26–44, figs. 28–9, 33 and 39). Unlike Kaupang, which was not founded until the beginning of the 9th century, the Gudme/Lundeborg complex displays an unbroken history over a long period of time (for a more thorough discussion of Gudme/Lundeborg, see Skre 2007j:446–8). But Kaupang/Skiringssal and Gudme/ Lundeborg can be compared in one respect. Evidence of bronze-, silver- and goldsmithing has been found at Lundeborg and Gudme in the same way as at Kaupang (Thrane 1993:51, fig. 34; Jørgensen 2003:177). Both complexes were sites for the collection, exchange and possibly also remelting of precious metals. A conceivable scenario is, therefore, that it was at sites such as Lundeborg, and later Gudme, that the idea of *aurar* was put into practice and so passed on from the 7th century to the Viking Period. Other sites in Southern Scandinavia showing continuity from the Early Iron Age to the Late, and with evidence of metalworking, such as Uppåkra in Skåne (Kresten et al. 2001), may have functioned as *aurar*-sites too. Boeslunde on Sjælland and Stentinget in North Jutland display a higher level of craft-specialization in the 6th and 7th centuries. These sites are particularly rich in metal finds when compared with ordinary agrarian settlements. Here we have, amongst other things, evidence of the reworking of metals and the use of weights, balances, and bronze and lead ingots (Jørgensen 2003:178–9). It was at sites such as these that the concept of *aurar* may have gained an early foothold and become part of the routine practices of payment and valuation that are also reflected at Kaupang. The emergence of the "*aurar*-sites" in Scandinavia seems to coincide with the development of a tradition of precise weighing that is also richly reflected in grave finds from the territory of Eastern Frankia (Werner 1962).

The most conspicuous material reflexes of the existence of the *aurar*-system at Kaupang in Skiringssal are the copper-alloy and lead weights (Pedersen, this vol. Ch. 6). Lead and copper-alloy weights are found at all significant sites with evidence of trade and craft in Scandinavia. Such weights have been found, for example, at Helgö (Kyhlberg 1980b: 177–97) and Birka (Gustin 2004a:18–18 and 21), Uppåkra in Skåne (Gustin 1999:258–9) and Lundeborg/Gudme on Fyn (Thomsen 1993:80). In the settlement area at Kaupang a total of 338 lead weights has been found – the largest single group here (Pedersen, this vol., Ch. 6.1.1:Tab. 6.3 and 6.4). According to Unn Pedersen, lead weights may have been used to weigh silver. Her contextual analyses show that in one case the use of these weights and the occurrence of silver can be related to a single plot in Kaupang (this vol., Ch. 6.4.1, Fig. 6:29). In the most recent excavations 1990–1995 in the old town area of Birka of, some 200 weights were recorded on a plot with copious evidence of bronzecasting (Gustin 2004a:21). As of yet at Birka, however, these lack any clear connexion with the production of objects of gold or silver. In Kaupang, on the other hand, there is archaeological evidence that silver may have been handled alongside casting waste (Pedersen, this vol., Ch. 6:162–4; Pedersen, in prep.).

The finding of lead weights in association with archaeological contexts with evidence of metalcasting is thus not intrinsically inconsistent with the idea that these weights may have had some function in economic transactions. Without being able yet to demonstrate this directly through archaeological finds, the weights may have been used in the craft zones in producing *aurar*-objects of precious metals. It is valid to argue that it was in the silver- and bronzesmiths' workshops that *aurar*-objects such as ingots and rings were produced and the quantities of silver and gold were also – perhaps – like those of bronze and lead, calculated using weights. The pre-

cise weighing of metals in workshops may, then, have followed the same practices and procedures as in the trading site. The weights in øre were thus part of the equipment of the metalworker as much as of the merchant (Pedersen 2001:24–6). The use of weights in both production and exchange was by no means mutually exclusive.

The Kaupang/Skiringssal central-place complex (Pilø and Skre, this vol. Ch.2:Fig. 1.2), which I interpret as an *aurar*-site, could have had the economic, political and indeed legal preconditions for a system of payment and valuation based upon the øre to be put into practice (Skre 2007j:446–8 and 450–5). The central place comprised the urban settlement of Kaupang with its evidence of trade and craft (Pilø 2007c:175–8, 2007d:195; Pedersen and Pilø 2007: 187–90), the chieftainly seat at Skiringssal with the hall at Huseby (Skre 2007e), and the *thing*-site at Tjølling (Skre 2007g). The assembly place, which seems to have functioned from the Early Iron Age to the early Christian Middle Ages (Skre 2007g:403–6), was simultaneously a juridical and a social arena. The *thing,* I believe, may have fulfilled a major function in legitimating the nominal function and convertability of the means of payment and the øre-unit. As the Icelandic *Baugatal* shows, it was at the *thing* that the øre-weight was defined and it was likewise there that the payment value of the compensation rings was determined. The *thing* may thus have been a central juridical authority and a social area legitimating *aurar* as a principle of value. The annual assembly at the *thing* may, then, have been similar to the market days of the town saints in the Merovingian realm that Frans Theuws has discussed using the anthropological concept of *tournaments of value* (see above, p. 263). It was at the *thing* that the chieftains and the leading farmers met regularly in order to settle legal problems, undertake exchange, make alliances, and confirm their position within the community. It was here, too, that the weight and value of *aurar*-objects such as the rings was legitimated in a public place, before people's eyes. At the *thing,* the purity and weight of the legal silver was determined, together with how many pennies would count as an *eyrir* (see above, pp. 282–3). In this way the central-place complex Kaupang/Skiringssal was similar to an economically sanctioned space in which several stages in the life-cycle of *aurar*-objects were brought together. *Aurar*-objects were produced in the workshops of the silversmiths; they circulated at the *thing* and in the trading site and changed hands; they came back and were broken up in the workshops only to be re-made once again.

Verðaurar and *vaðmál* – Commodity-money in Late Iron-age Scandinavia

There is yet one more facet to economic practice in the Late Iron Age. Objects of precious metal such as ingots and rings were not utterly essential as media of transactions in which the øre-standard had to be materialized. This standard could probably also be embodied in non-metal objects. In the same way as the denier in the Carolingian realm was both a material coin and an immaterial unit of reckoning (see above, pp. 270–1), so too the øre comprised simultaneously a material and an abstract principle of reckoning and payment that may have been in use in Late Iron-age Scandinavia. Just as the denier, *aurar* could be expressed and counted in the goods one was dealing in and of which we only find traces in later written sources. In relatively early law-codes of the 12th century such as the Icelandic *Grágás,* the Norwegian Gulathing Law, and the earlier Swedish Västgöta Law, there are references to a system of commodity-cash in the North in respect of which reckonings were made in *verðaurar* (Engeler 1991:132–3). Etymologically, *verð* can be translated with the words "price" and "value", although also with "purchase" and "payment" (Naumann 1987:374–6). In a transferred sense, I believe that we can see here a separation from the bodily rooting of *aurar* in gold and silver objects. The concept of *verðaurar* can then also be applied to other objects which correspond to a value of a certain number of øre.

A further medium in which relationships of price and value could be expressed in øre was textiles: wadmal of a certain length, which was measured in ells. The term wadmal (Old Norse *vaðmál)* is a compound of *vað,* "woven cloth", and *mál,* meaning "measure" or "unit" (Finnur Jónsson 1936:155 n.6). This term can be translated as "measure of cloth" or in a further monetary sense as "cloth-money" (Engeler 1991:80–1). Unlike "metal-øre", the unit of wadmal was not calculated in terms of weight of silver but rather in terms of the quantity of cloth in length and breadth and the quality of the cloth in respect of material, colour and technical quality. In the same way as silver, textiles could be the subjects of economic calculation and even themselves be used as a way of making payments or valuations in transactions separate from the socially binding sphere.

According to documentary sources from Iceland, there was a firmly fixed rate of exchange between wadmal, i.e. textile of a certain length, width and quality, and a weighed øre of silver (Ebel 1985:117–8). Wadmal was consequently counted in terms of the nominal and legal units *lögaurar.* One *lögeyrir* was the equivalent to an unused woollen cloth of lower quality that was 6 ells in length and 2 ells wide (Engeler 1991:80–1). These relative values are documented from the 12th and 13th centuries in the law-codes *Grágás* and *Jónsbók* (Finnur Jónsson 1936:155). *Grágás* also contains the information that around the year 1000 a distinction was drawn between silver of two different qualities. Four *lögaurar* of wadmal were then the equivalent of an øre by weight of *bleikr silfr* – "pale" or, in other words, impure silver – but 8 *lögau-*

rar of wadmal were the equivalent of an øre of pure silver, which was referred to in the sources as *brent* ("burnt") *silfr* (Naumann 1987:377).

It may be more than mere coincidence that evidence of organized textile-production coincides with the period in which *aurar* were introduced as a principle of reckoning and value in Scandinavia. In Denmark there is archaeological evidence of specialized and large-scale production of textiles which may go back to the 7th century. At Bejsebakken in North Jutland a settlement consisting of five longhouses and more than 350 sunken huts has been recorded which produced a large number of spindle-whorls and loomweights. At Næs on Sjælland it was not only remains of sunken huts with weaving equipment that were found but also structures that indicate that flax was retted on a large scale for the manufacture of linen. This complex is dated to between the late 7th and early 9th centuries (Jørgensen 2003:179). In the same way as with *aurar,* the growing North Sea trading network of the 7th century may have fulfilled the necessary preconditions for cloth being both dealt with as trade goods and at the same time serving a function as "money".

Both silver øre and cloth-money were counted in the abstract units of *lögaurar* and could thus be correlated with other goods. From the end of the 12th century we have data on prices that were proclaimed at the Icelandic Althing. Thus six arctic fox skins were worth 1 *lögeyrir* (Naumann 1987:387–9). If we follow the information from Iceland, 48 arctic fox skins would be worth 8 *lögaurar.* This is the same as 1 *eyrir* of pure silver, i.e. a silver ingot between about 26 and 29 g. Although some scholars warn against projecting information on commodity-money and prices from later medieval texts back into the Iron Age (e.g. Hatz 1974:93), few, if any, attempts to reconcile written, archaeological and numismatic evidence on the same terms have ever been made. Although there must be doubt as to whether relative prices from the 12th and 13th centuries in Iceland were also valid in Kaupang in the 9th and 10th centuries, this need not count as an argument against a system of commodity-money during the Late Iron Age (for a similar approach to commodity-money, see Skre this vol. Chs. 9:324, 327–8, 10:340–8). The archaeological and metrological evidence seem to be in support of this. If Ohthere offered his goods from the far north for sale in Kaupang he presumably thought in terms of øre both as a weighed silver unit and as the units of reckoning, *lögaurar.* He need not, however, have had access to silver to be able to participate in exchange. All that was necessary was for the other party to the deal to accept øre as a basic unit of value.

Conclusions

In the present section I have discussed the principles behind the *aurar*-standard on the basis of archaeological and numismatic evidence such as coins, weights and rings, along with historical evidence. The examples come from a period stretching from the end of the 6th century to the beginning of the 10th, and illustrate the practices of weighing and valuing both gold and silver according to a common convention in non-monetized societies. The ability to reckon and think in terms of *aurar* through coins may give us an insight into and understanding of how standards could be employed and transmitted in societies that lacked a strong central authority. Although coins were not accepted as a form of currency in Scandinavia during the Late Iron Age because they themselves were not regarded as having value, the idea of value, and of countability, was made material in other objects. The *aurar*-system did not depend upon a royal authority to guarantee its value. As standard units of reckoning, *aurar* were rather given legitimacy by the carefully weighed gold ring. This gold ring, made from gold coin, can also be understood to have been a transcendental principle, a divine and proper order of which we find reflexes in the story of Odin's eternal ring Draupnir. The gold ring belonged to the world of the gods, and as an inalienable possession it gave the *aurar*-units their permanent and untouchable stability. It imbued *aurar*-objects of silver with the authenticity they needed to be accepted as media of value. Gold was deposited in marginal zones between water and land. The carefully secreted gold ring was an imaginary but at the same time a firm axle around which notions of value and price in the human world could develop. In the concept of *aurar,* I believe, lies the idea of the coherency of an order sanctioned by the gods.

It may have been the expanding North Sea trading network of the 7th and 8th centuries that provided the necessary preconditions for the establishment of the *aurar*-system. Reckoning in øre may have developed as a method of making payments and valuing in craft and trading sites in Scandinavia that were in contact with this network. The underlying unit of reckoning for the *aurar*-system was the Merovingian ounce. The use of øre in Scandinavia should therefore – in the same way as counting in coins in monetized societies – be understood as the practice for valuing precious metals according to their weight and purity in carefully proportioned quantities. At sites whose economic activities were based on the øre there was a close connexion between metalworking and the use of weights.

Aurar-rings are like coins in being nominal units of value and reckoning. This is shown in Norse lawcodes. In *Baugatal* and the Frostathing Law the weight of compensation rings is defined as, for instance, *baugr tólf-eyringar* – i.e. a ring worth 12 øre – or *tvítug auri:* a ring worth 20 øre (Engeler 1991:131). In contrast to coins, the rings had always to be weighed, in order that their weight in øre could be established. They were checked for weight and tested in public. We are told so in the Icelandic *Baugatal*, which gives the rules on how manslaughter may be paid for in the form of silver rings. The suits and the payment had to be made at the *thing* in the presence of witnesses. After the payment of the sum in compensation the security of the man who had committed the offence and of his kin was guaranteed (Dennis et al. 1980:182–3). It was also on this occasion that payment in rings was sanctioned and the nominal value of the rings in terms of øre and marks was determined (see Ch. 8.5, Tab. 8.10). I believe, however, that the ring of silver was not the same as coin in that coins could also be used in economic transactions outside of any socially binding sphere. The significance of the ring as a medium of value was linked to the sphere of jurisdiction and the code of honour of the kin-based society. In this way, the silver rings presumably served first and foremost as blood-money in the case of a killing.

In economic relations, the authenticity of the gold ring was transposed instead to other items such as the silver ingots which were used as silver currency in Kaupang (Hårdh, this vol. Ch. 5.6). It was these ingots that were the media of value of the Early Viking Period, and which served as currency. Large ingots were weighed in øre-units just like the rings (Hårdh, this vol. Ch. 5.6). Ingots could be bought and sold, they could be counted, and they could be related to other goods and so define the exchange-value of those items. Finds of moulds for ingots at Kaupang (Hårdh, this vol. Ch. 5.6.3), as at Hedeby, for instance (Gjøstein Resi 1979), or Dorestad (Besteman 2004b: 28–9 and 33), indicate that the melting down of precious metals to produce larger units was practised at the major trading sites of Northern and Western Europe. This is probably one reason why so few Western pennies found their way to Scandinavia in the 9th century.

The recasting of coined metal, which may have been done on the Continent itself, may also explain why Merovingian gold coins of the 7th century and silver sceattas of the 8th are almost entirely absent from Scandinavia. One illuminating exception is the largest gold hoard of the Early Viking Period, from Hoen near Kaupang, with its unique combination of rare gold coins re-used as pendants (Skaare 1988) including one Merovingian solidus or *aureus.* Hoen demonstrates that gold coins like silver coins, did not circulate freely in Southern Scandinavia during the Early Viking Age but were melted down. Coined metal was transformed into valuable *aurar*-objects. In the same hoard there were also massive gold rings which appear to have been weighed to the øre-standard (Graham-Campbell 1999). In contrast to the exceptional character of the Hoen hoard, the Broholm treasure at Gudme contained not only bracteates and *aurar*-rings of gold but also cut gold wire and ingots of silver alloyed with gold (Fig. 8.14). Broholm ought therefore to be interpreted as a smith's hoard at Gudme, which, unlike Hoen, therefore still belonged to the human world.

Finally, the øre as a basis of reckoning could be transferred to other items which became the objects of economic transactions. Since *verðaurar* and *lögaurar* as a scale of reckoning were based upon metal-øre, implicitly of gold or silver, or also of valuable cloth, a system of exchange could take shape that was able to function separately from the sphere of gift or simple barter. There is no doubt that there was a scheme of things that was based upon the distributional principle of a gift-economy, but gifts and luxuries could be commodified too: in other words they could be bought and sold in appropriate circumstances. This could perhaps take place at sites such as Kaupang, where the conditions allowed for reckoning in *verðaurar.* Perhaps only there was it possible to buy a prestigious Frankish Ulfbert sword, which otherwise only chieftains could obtain as a gift. That could be facilitated by weighed silver, cloth or other quantifiable goods which people both traded and produced in Kaupang – such as schist whetstones, soapstone vessels, beads and the like. At *aurar*-sites such as Kaupang, it was possible to negotiate or haggle over a price using øre as a stable and unalterable point of reference.

But the whole *aurar*-system that was constructed in Scandinavia during the late Merovingian Period came under pressure when different conventions of payment became established outside of the *aurar*-sites towards the end of the 9th century. This process of transformation seems to coincide with the introduction of normalized weighing equipment from the monetized areas of the Middle East and Central Asia via Eastern Europe and the Baltic Sea area. This was the age of fragmentation and of the ertog, which we shall examine more closely in the following, final section of this chapter.

8.5 Ertogs, *þveiti* and fragments

This section attempts to put in place the final pieces of the jigsaw that will adumbrate the full picture of how silver was dealt with and valued as a form of currency at Kaupang. When Ohthere visited Kaupang in Skiringssal some time in the last quarter of the 9th century, the exportation of Islamic silver coins, dirhams, from the Baltic Sea area to the West on a greater scale had begun. He must surely have seen such coins with his own eyes. Analyses of dirham finds show that this stream of silver from the East was not evenly spread over the whole of Southern Scandinavia, but rather was channelled and re-distributed through urban settlements such as Kaupang (Kilger, this vol. Ch. 7.9). The dirhams came in with new ideas about how precious metals should be weighed and valued. The silver was divided into smaller portions and weighed using normalized weight-sets (Steuer 1987:474–9; Gustin 2004c:97–107). Widely-travelled individuals such as Ohthere will, in all probability, have been aware of the growing access to silver over Scandinavia as a whole, and of the new procedures for payment with different weighing equipment.

The process by which the Oriental weights were introduced has itself most recently been discussed in Ingrid Gustin's dissertation (2004c). She focussed primarily on the smaller, so-called cubo-octahedral weights, also known as polyhedric weights. Her principal topic for investigation was how ideas of a standard could achieve a foothold even in non-state societies. As Gustin stresses (2004c:123–51), the notion of a standard is expressed by the standardized weight and stereotypical design of the cubo-octahedral weights (Pedersen, this vol. Ch. 6:Fig. 6.21.b). The polyhedric form was copied as a meaningful element in several items of Scandinavian jewellery and tools (2004c:269–308). This was already familiar, as a formal element, from the Merovingian Period, and perhaps earlier still. The acceptance of the cubo-octahedral weights in Scandinavia during the 9th century is, in Gustin's view, a result of this unvarying form having already long been known. It provided confidence in exchange situations where the parties did not know one another but had to come to an agreement (2004c:174–81). In her work, Gustin attaches particular importance to the cultural codes that led to the acceptance of the standardized weights in contexts where organized exchange over long distances was emerging. Here there was an urgent need to ensure dependable modes of transaction (2004c:203–5).

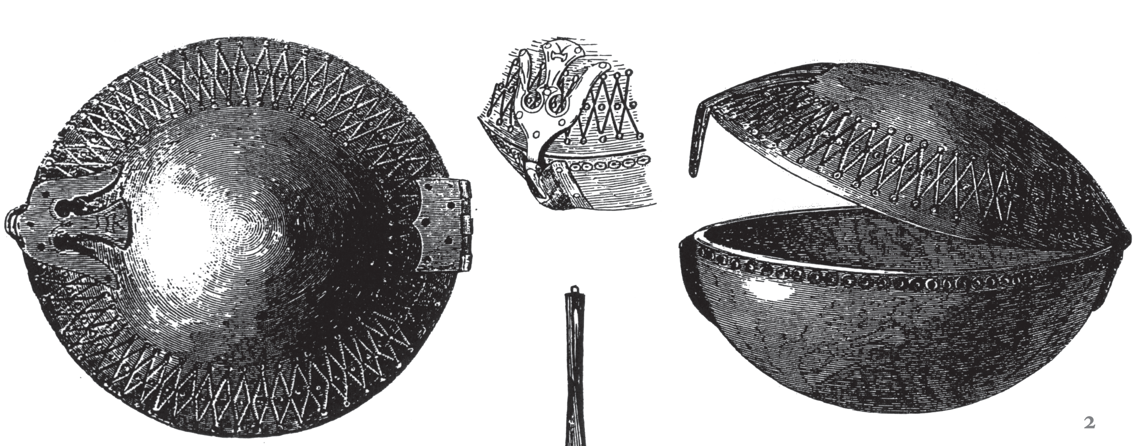
There were several congruent factors which led to these special weights becoming an accepted item of weighing equipment. This was when large quantities of dirham silver from the East began to circulate in the Baltic Sea area, and the exchange of goods was growing. The decisive factor, however, was the emergence of a group of individuals who were engaged in long-distance trade and who developed a common identity and similar values that were reflected, inter alia, in material culture. It was at this point that the cubo-octahedral form became a prominent and meaningful element of costume; on ring-brooches, for instance (2004c:205–34). It was likewise at this point that the cubo-octahedral weights were developed into a common standard amongst the individuals of this group.

In this section, I shall examine this process from a different perspective, and take a closer look at what was placed in the other half of the pair of scales, namely the hacksilver. It is the relationship between the normalized weights and the fragmented silver I wish to investigate. As a synonym to the terms hacksilver, or fragmented silver, I shall here use a term that refers to the shapeless state of the silver. Silver as a substance that has lost its body and thus also its intrinsic connotations of value I shall call *amorphous* silver. This is the perspective from which I shall discuss the influence of hacksilver on exchange relations. I shall make a suggestion concerning what the spheroid weights of the Viking Period may have been known as.

Two models of Early-medieval silver economy

Our understanding of the connexion between the hacksilver economy and the use of what is known as Oriental weighing equipment depends to a large extent on Heiko Steuer's many works (e.g. 1984, 1987, 1997, 2002). Steuer has employed an interpretative model which enables him to describe the introduction of the hacksilver economy in a wide, European perspective. It is appropriate, therefore, briefly to recapitulate this. Steuer distinguishes between two different economic systems of the Viking Period: the *Gewichtsgeldwirtschaft,* which was based upon weighed silver, and the *Münzgeldwirtschaft,* in which coins were the standard means of payment. The *Gewichtsgeldwirtschaft* established itself in Scandinavia and the Slavic areas of Eastern and Central Europe at the end of the 9th century with the introduction of sensitive weighing equipment of Oriental character based upon Islamic prototypes (Fig. 8.15). This was precision equipment such as folding balances which made it possible to weigh silver very finely. But it was more than anything else two characteristic types of weight that were the essential components of the *Gewichtsgeldwirtschaft.* These were the smaller cubo-octahedral and the heavier spheroid weights with flattened poles (= "oblate") (Figs. 8.18 and 8.20; Pedersen, this Vol. Ch. 6:Fig. 6.21.b). Both types respect the same system of weights. They are also highly uniform in terms of form. Steuer therefore describes them as "normalized" (Germ. *genormt).* With their unvarying design these weights are essentially different from the very common but formally very diverse lead weights of Scandinavia. Under the *Gewichtsgeldwirtschaft,* according to Steuer, silver was valued according to its purity and weight. Silver could be dealt with in any form, such as ingots, jewellery or coin, as well as in the form of hacksilver. Measuring the quantity and quality of the silver was the responsibility of the individual merchant, and not checked by any state institution. Areas where the *Münzgeldwirtschaft* was in practice counted coins by quantity. According to Steuer, this economy ran according to a quantitative principle of reckoning, while the *Gewichtsgeldwirtschaft* ran according to a qualitative principle (1987:406).

Here, however, lies one of the fundamental problems with Steuer's model. The opposition between quantitative and qualitative principles of reckoning was not the essential difference between these economies. Both qualitative and quantitative features of



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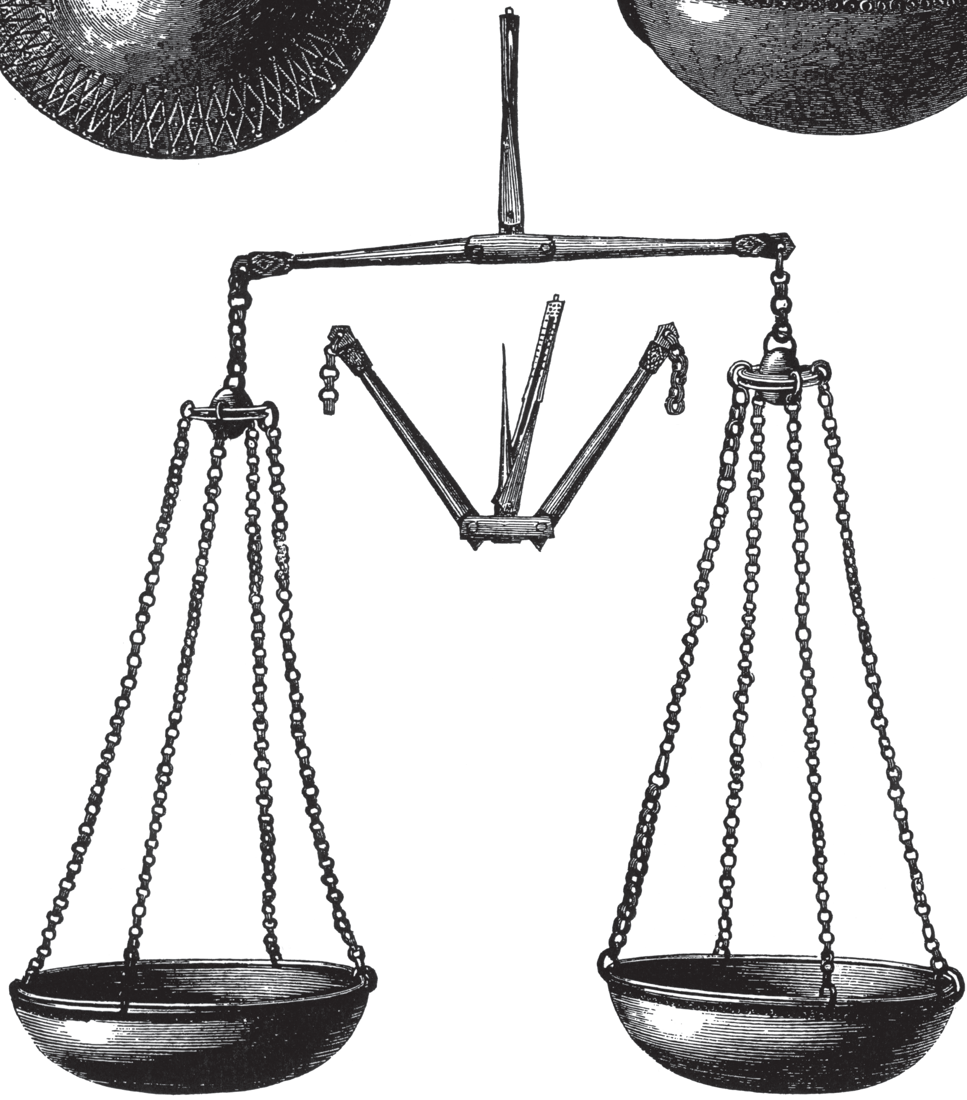

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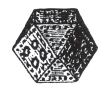

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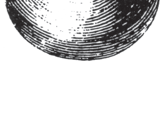

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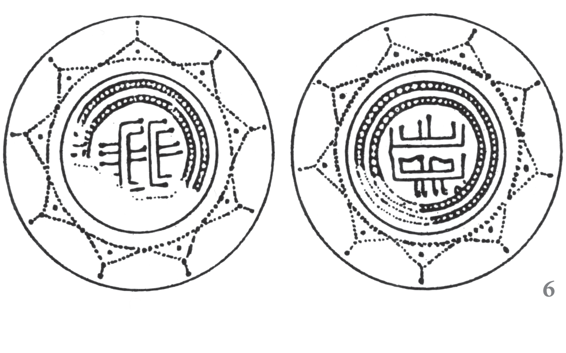

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Figure 8.15 *Weighing equipment: folding balance (1); balance case (2); spheroid weights with flattened poles (3–4 and 6); cubo-octahedral weight (5) (Jansson 1988:fig. 4).*

reckoning and valuation were present in both the coin- and the weight-economies. What is essential to economies based upon coinage, in my view, is that the coin as an object was dealt with and valued as an *indivisible* nominal unit. It was the coin *itself* that was the smallest object of reckoning and of value. Nominal principles were present in just this way also in the Scandinavian *aurar*-reckoning. The basic idea of *aurar*-reckoning was that a calculable number of coins made up the *eyrir* (see above, pp. 282–3). As a result *aurar*-objects could also assume a nominal function. In the same way as coins in monetized areas, *aurar*-objects such as rings or ingots were *nominal,* and in principle *indivisible,* items. The value of the coin, like that of the ring/ingot, was manifested in the completeness of the object. In this sense, both the coin and the ring as an object of reckoning was *whole;* and, as an object of value, *holy.* I believe that this insight emphasizes a different aspect; one that is more fundamental than Steuer's principle of quantity. What, however, of the qualitative principle of reckoning which in Steuer's view was characteristic of the weight-economy? Steuer stresses, quite rightly, that silver alone was regarded as an equivalent for payment. The qualitative principle of reckoning was concerned with the quantity and purity of the silver. I, however, would rather emphasize a different aspect of the *Gewichtsgeldwirtschaft,* namely the formlessness of the silver; in other words, its *amorphous* and thus non-nominal character. The external form of the silver no longer mattered. Rather it was handled as broken up silver, irrespective of whether it had previously been coined, or in the form of jewellery or ingots. Fragmentation negated the nominal meaning of the silver object.

One may ask whether Steuer's term *Gewichtsgeldwirtschaft* has not created a certain amount of confusion rather than clarity. The German term could be translated as "weight-money economy": in other words an economy based upon the weighing of metal and thus weight (Germ. *Gewicht);* or as an economy using balance-weights as money, and thus focussing upon those weights, attributing them with some sort of monetary function (e.g. Kyhlberg 1980b:196–7, 1986:160–2).[43] In some interpretations, Steuer's *Gewichtsgeldwirtschaft* has been understood in the first sense: namely the use of silver according to weight (e.g. Malmer 1996:90; Hårdh, this vol. Ch. 5.4). This suggests to me that Steuer's quantitative and qualitative principles of reckoning may have created the impression that silver was not weighed under the *Münzgeldwirtschaft;* just that coins were counted. But we have to remember that balances and weights were in common use in monetized areas too. Weighing equipment, as Steuer himself was able to show, was brought into use alongside coins in a various monetized situations. It was particularly in periods of transition, or in situations of crisis that put the monetary system under pressure, or in areas where coins of different weights and purity were in circulation, that weighing equipment was essential.[44] Scales were also used for checking the weight of coins. Scales and weights may have also been used at larger trading sites in handling large quantities of coin in terms of larger weight-units such as the Carolingian pound-weight (see above, pp. 271–2). There is also ample evidence in written sources from Norway of the 12th–14th centuries for the practice of weighing coins (Gullbekk 2003:215–39). Thus coins were both counted and weighed in the *Münzgeldwirtschaft.* What constituted the most typical trait of the *Gewichtsgeldwirtschaft* was not the practice of weighing alone but rather the acceptance of the normalized weights in connexion with payment in hacksilver. These weights symbolized a monetary concept, albeit at a quite different level of abstraction from either coins or *aurar*-objects. It is this process of abstraction that we shall consider more closely in the following section, leading on to the fragmentation of *whole* and *holy* silver objects such as coins and rings.

Commerce and fragmentation in the Caliphate

There are two fundamental considerations helping to explain how weight-standards such as, for example, the øre gained a foothold in Scandinavia during the

43 Steuer has hinted (1987:448) at an interpretation consistent with the second meaning, namely that the normalized weights themselves assumed a function like cheques or bills of exchange.

44 Steuer's best known and most quoted work (1987) investigated the relationship between the use of coin and the employment of weighing equipment. This study examines, amongst other things, the use of the weighing equipment in the Late La Tène Period, in the Roman Empire, and the Byzantine, Merovingian and Viking Periods.

Iron Age. One of these is that the øre-weight that is represented in the weight-sets and the finds of rings from the Norwegian Merovingian Period and Viking Period was originally defined in states with an established monetary system. The other is that the øre-weight came to be used in exchange relationships in unmonetized societies in a very concrete form. In other words, relations of value and reckoning were given material form. The concept of øre was preserved and transmitted in the form of coins, rings and weights. The same fundamental considerations can also be used, I believe, to explain the establishment of the *Gewichtsgeldwirtschaft* in the Viking Period. There must surely have been a consciousness and a knowledge of the original monetary function and significance of the normalized weight-sets, even in Northern and Eastern Europe. This holds at least for the phase of introduction when these first came to be used. But what weight-standard was it that was made material in these normalized weights? To start with, we need to take a brief look at the monetary situation in the Caliphate.

There is considerable agreement in metrological studies that the Islamic unit of reckoning, the mitqāl is represented by the normalized weights (Sperber 1996:110; Steuer 1997:281–5). *mitqāl* actually means "weight" and thus, in the same way as the Greek *stater* and Latin *pondus,* stands for the ideal weight that pieces of precious metal should have (Grierson 1960:255). Just like the solidus of the Late Roman Empire, the *mitqāl* was the basic unit of reckoning of the Caliphate. It was also, in metrological terms, identical with the Islamic gold dinar (Grierson 1960: 255). The *mitqāl* was used to define the weights of both the gold coin, the dinar, and the silver coin, the dirham (Welin 1958:510). There is disagreement over the value of the *mitqāl* in the modern metric system (Witthöft 1985:400–1; Steuer 1997:287).[45] In the Caliphate the exchange rate between gold and silver was constantly changing. The basic gold coin-unit, the *mitqāl*, remained a constant, but the prices of silver in relation to gold were altered several times (Bolin 1953:16–17). The cost of silver and gold thus had to be under constant review when payments were being made. As a result, silver was dealt with in two different ways. One was in the form of the coin, the dirham, which was of standardized weight in relation to the coin-base *mitqāl.* According to inscriptions on weights the weight of the dirham was presumably counted as two-thirds of a *mitqāl* (Balog 1976:25–6; Welin 1958:510). The other way in which silver was used was in the form of heavier, so-called "market weights". In this case, the dirham was probably regarded as an abstract unit of reckoning and weight, also called the *dirham al-kail* (Hinz 1955: 2–3; Welin 1958:508). Both the coin-dirham and the weight-dirham were probably reckoned to a certain number of *harrūba* or *qīrāṭ,* which was the Arabic carat (Hinz 1955:1–2; Welin 1958:509). Controls were maintained by means of state-sanctioned coin-weights of glass which were apparently recalled or destroyed when the ruler changed (Balog 1976: 10–11, 1980:55; Steuer 1978:257) (Fig. 8.16).

Other factors also promoted the use of weighing equipment in the Caliphate. In the Islamic empire the monetary system was not under the absolute control of the central government, i.e. the caliph, who was both its political and its religious leader. The Islamic coin-scale was introduced at the beginning of the 8th century when the new basic gold coin, the dinar, was defined against the *mitqāl* (Grierson 1960; Bates 1986). However already in the same century several regional coin-standards were established in which the dirham had subtly different weights, as, for example, in North Africa and in the Middle East. Another typical feature of the Islamic coin-system is that there were no coin-recalls such as there were in medieval Europe. Both gold and silver coins circulat-

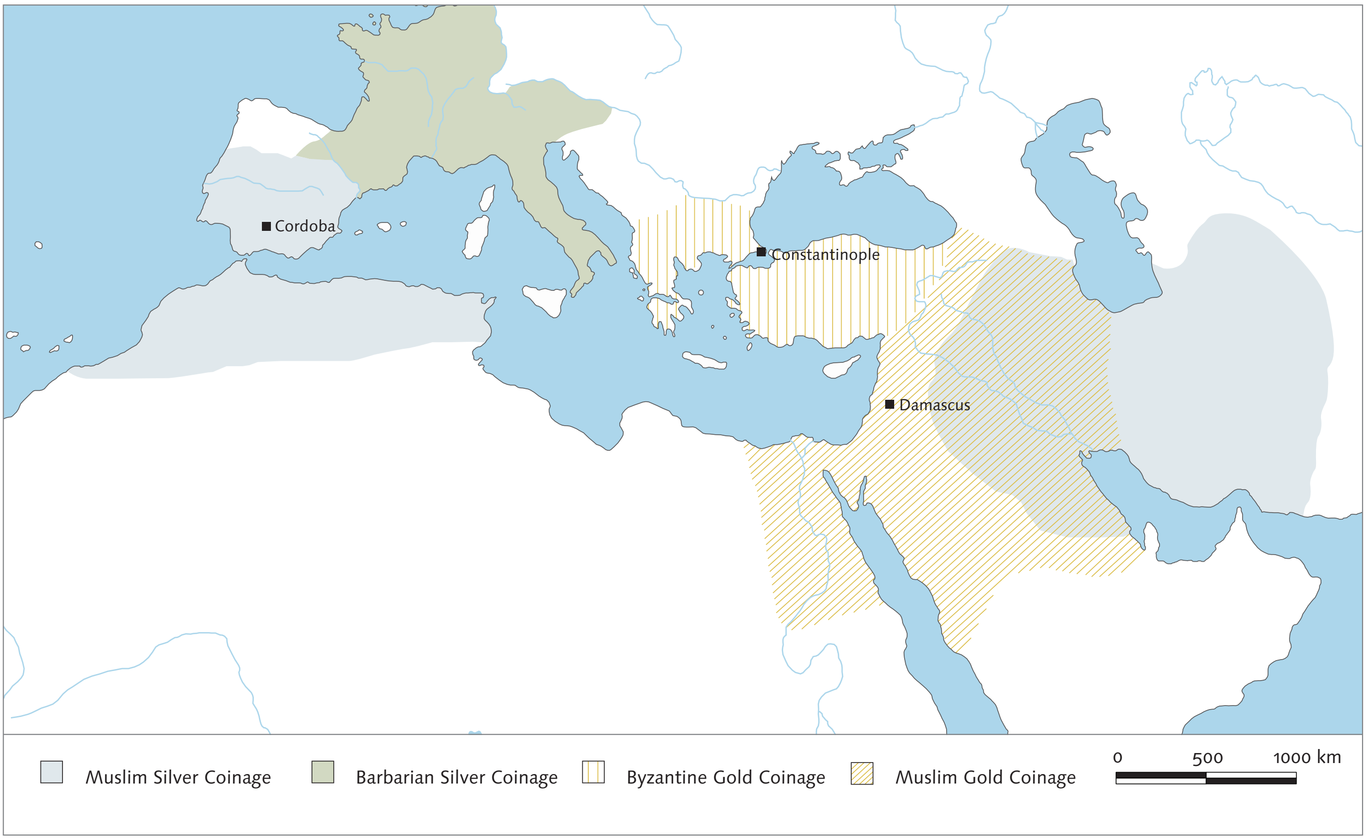
Figure 8.16. *Egyptian coin-weight made of black, opaque glass issued under the governor and finance director Abd al-Malik. B. Yazid (A.D. 751–3 and 755–8) during the rule of Caliph Al-Mansur (A.D. 754–75). The inscription declares that the coin-weight is of the weight of a dirham of full weight. Scale 2:1. Weight 2.78g. (Balog 1976:129, no. 357).*

ed freely all around the Caliphate so that issues from different centuries and regions came to be mixed (Kilger, this vol. Ch. 7.4). In order to be able to calculate the value of coins of different exact weights coined metal was primarily reckoned in terms of weight. This means that people would think initially in units such as the *mitqāl* and the *qīrāṭ* rather than in numbers of coins. Gold and silver coins were used as currency but also as trade goods in themselves. This is shown by documentary sources of the 11th and 12th centuries from the Caliphate (Goitein 1967:230–3). In a monetary system of this kind, then, scales and weights that were calibrated by the *mitqāl* and *qīrāṭ*, were absolutely essential. The Islamic monetary system was created using the Roman-Byzantine coin-system as its model (Hinz 1955:1). The same duodecimal counting system was employed. This is the monetary background against which, I suggest, we need to consider the normalized weights. Using the expressions I employed before, I consider that the normalized weights materialized the Islamic *mitqāl*-system and so also the practice by which coined metal was calculated.

However the weighing and valuing of coined metal in the Caliphate was different from the use of dirham silver in Eastern and Northern Europe in a crucial way. In those areas it was apparently acceptable to break up the original form or the nominal unit that was represented by the actual body of the coin. This practice was most definitely not the norm within the Caliphate. In the Caliphate's monetary system the coin retained its bodily wholeness and thus its fundamental significance as a nominally defined object. There are, however, exceptions. Lutz Ilisch (1990) has drawn attention to the occurrence of small quantities of dirham-fragments in a number of hoards from the monetarily re-organized Caliphate. These fragmentary dirhams are usually broken up rather than clipped. The earliest hoard containing fragments known as yet is Sinaw in the Middle East (t.p.q. 840/1). The historical evidence tells us that the fragmentation of coins was a very controversial matter in the Caliphate. The legal implications of breaking coins up were discussed in the 9th and 10th centuries by the four juridicial schools of Islam (Ilisch 1990:122–3). As Ilisch emphasizes, the dirham always retained its nominal and thus its monetary nature as minted silver. The coin-fragments were used, in his opinion, rather to adjust the weight of the whole dirhams that were placed in the balance-pan. This very probably unofficial practice of breaking coins up was probably a reaction to a clear weakening of the monetary system after the death of Caliph Harun al-Rashid in the first half of the 9th century. After that, coin-production was of a lower standard both in respect of weight and the striking of the dirhams (Kilger, this vol. Ch. 7.5). When dirham hoards appear in the Baltic Sea area in the 9th century, we encounter the first signs of the fragmentation of silver. In some hoards the dirhams are very highly fragmented.[46] It is conceivable that the monetary crisis in the Caliphate gave rise to the practice of fragmentation that was further developed and modified in the Baltic zone. If the fragmentation of coin was an exceptional practice in the Caliphate to allow coins to be weighed according to a particular standard weight, it developed into an accepted convention outside the borders of the Caliphate.

45 Walther Hinz (1955:1–2) has reconstructed the mitqāl at 4.23 g using the coin-weights known as exagia that were employed in the Caliphate. Other scholars, for instance Philip Grierson (1960:253–4) assume a higher theoretical weight of 4.25 g. Grierson based his view on G. C. Miles's metrological studies of both dinars and glass weights. However it has also been suggested that mitqāl may not necessarily refer to the basic Arabic gold coin, but that in the eastern parts of the Caliphate in the 8th and 9th centuries it could also have been the earlier and lighter Persian-Sassanid basic silver coin of 3.9 g (Welin 1958:510). Grierson (1960:255–6) believes that the mitqāl, which Arab sources reckon as being 20 qīrāṭ, was an earlier metric unit which may originally have been based upon the Attic drachma of 4.37 g. Drachmas circulated in great quantities in the Arabian peninsula in pre-Islamic times.

46 All of the dirhams in one of the earliest of the Gotlandic hoards, Norrgårda-Norrbys II (t.p.q. 833), for instance, are fragmentary. Most of these fragments are no larger than a quarter of a coin (CNS:1.2.10). The uncoined silver objects such as the rings, however, were not broken up. That this fragmentation of the silver took place outside the Caliphate is shown by the small cut marks, "nicks", found on even the smallest fragments. This testing of the coins was very probably undertaken beyond the borders of the Caliphate (Kilger, this vol. Ch. 7.5).



Reflexes of the Islamic weight-system in Northern Europe

The Islamic *mitqāl*-system may be represented physically by the cubo-octahedral and oblate spheroid weights. The cubo-octahedral weights may embody a system of weighing in fractions of the *mitqāl*. The smallest specimen found weighs 0.35 g. This might correspond to one-twelfth of the *mitqāl*. The largest weigh up to 4.25 g, which would be approximately one full *mitqāl* (Steuer 1997:112). Another indication of the *mitqāl* having been the unit of reference is the punched markings typical of these weights (see also Pedersen, this vol. Ch. 6:3.4). The punchmarks are placed symmetrically in two rows on the square faces. The positioning of the punchmarks is very like what we are familiar with on dice. The multifaceted weights have from 1 to a maximum of 6 punchmarks on each side. Adding together the punchmarks on two opposite sides, one cubo-octahedral weight can carry up to 12 punchmarks, or possibly 12 units (Steuer 1997:281–3). What is striking is that units of 5 or 10 are absent, indicating that these weights followed a duodecimal system of reckoning (Steuer 1997:284). This is yet another link to the Roman-Byzantine counting system. In contrast to the cubo-octahedral weights, the spheroid weights were calibrated to intervals of a basic unit of c. 4.0–4.25 g (Steuer 1997:285–9). These may represent multiples of a *mitqāl* (Steuer 1997:fig. 205). The heaviest can weigh as much as 200 g (Steuer 1997:46). As on the cubo-octahedral weights, here too we see punchmarks on the weights, with values up to 12 punchmarks and double that (Steuer 1997:285–6).

As many have noted, the punchmarks do not reflect absolute weights. They are thought rather to indicate the position of the weight in a set of weights (Kyhlberg 1980b:270–1; Sperber 1996:66; Steuer 1997:281). This is unquestionably correct, although at the same time it is a fact to be modified. I believe that the punchmarks show that a weight-unit was being referred to which everyone who used the weights was familiar with. This was equally the case with those weights with the same number of punchmarks from different find-places which may vary in weight – often quite considerably – if we measure them in grams. The variation between the weights with the same number of punchmarks may be the result of corrosion, or of post-depositional damage. The differences may also derive from the process of manufacture. It was the weight of the calibration-weights that the various workshops referred to that determined the absolute value of the basic unit which was represented by the set of weights. It may have been the cubo-octahedral weights themselves that were used for calibration. Small changes in absolute weight were copied and reproduced in this way via a large number of workshops over a considerable geographical area and a long period of time.[47] The variations could also be explained as a result of the fact that local grain-standards with different specific

Figure 8.17 *Distribution map showing the medieval states of Europe, the Mediterranean and the Middle East using silver or gold coins. Re-drawn by Elise Naumann, based on Spufford 1988:map 3.*

weights were used in calibration (Stenroth, in prep.). Thus there were no essential reasons why weights with the same number of punchmarks should weigh exactly the same.[48] The spheroid weights from mainland Sweden, for instance, observe a lighter mitqāl module than the weights on Gotland (Sperber 1996: 55, 70, 83–5 and 110). This, however, is probably not a question of two different weight-systems, as Erik Sperber has suggested, but rather, perhaps, the result of the use of different grains (Swedish *kornsorter)* in calibrating the weights. This will be more thoroughly discussed in a following section (below, p. 314).

Despite these inconsistencies in weight, it was always possible to check individual weights by applying the principle of double-weighing. There are recent ethnographic analogues that describe double-weighing as a complex process between two parties to a trade, by which each checks the weights of each other's set of weights, and the quantity of precious metal that is paid, in two separate procedures. This means that one can establish that the quantity of silver or gold that is transferred in the transaction is absolutely the same from both the seller's and the buyer's standpoint (Steuer 1987:500). Through double-weighing it was possible to exclude individual weights that diverged too far from the calibration model, be they in the seller's or the buyer's set of weights. Although double-weighing did not guarantee that weights with the same punchmarks were exactly the same weight – if we measure them by the modern metric system – but this practice was able to confirm that one was close to the ideal theoretical weight represented by the punchmarks.

At present we do not know in which monetized areas the cubo-octahedral weights were first produced and used (Gustin 2004c:318–21). There are finds from the Middle East and the Ottoman Empire (Kisch 1965:97 and 101, fig. 53; Steuer 1997:46). There is ethnographic evidence of weights of cubo-octahedral and cylindrical shape being used as weighing equipment by merchants participating in the gold trade in Western Ethiopia as recently as the 1930s (Sandvik 1935:70; Thingstad 2007). From a metrological viewpoint, it is conceivable that cubo-octahedral weights were used in the fine weighing of gold coins in their area of original use. This may be implied by the calibration of the basic gold coin in terms of grains.[49] It was particularly in the Eastern Mediterranean lands that gold coin was in use in the 7th and 8th centuries (Spufford 1988:37–9). The territories of the Caliphate which bordered directly upon the Byzantine Empire, namely Palestine, Syria and the northern parts of what are now Iran and Iraq, belong in this area, while Egypt and the Arabian peninsula are also credible candidates (fig. 8.17).

The spheroid weights were derived from Roman prototypes (e.g. Kisch 1965:97, fig. 51). Down to the 6th century spheroid weights were made of solid bronze or brass in the Byzantine territories (Steuer 1987:427 and 432). Then the trail disappears, and, just as with the cubo-octahedral weights, use of this type in the area subject to Islamic cultural dominance cannot, as of yet, be demonstrated from archaeological evidence. Spheroid weights were familiar in the area of what is known as the Saltowo-Majazkoi Culture between the Rivers Don and Donec in the ancient area of Khazar settlement (Steuer 1997:46). However the Roman, Byzantine and Khazar weights

47 Unfinished finds from Gotland show that the small weights were manufactured in Scandinavia (Östergren 1989:171–2, fig. 156).

48 The metric system of weights and a decimal counting system which we use for our metrological studies seem to me paradoxically to create an expectation of absolute precision in terms of our modern measures.

49 According to Steuer, the smallest cubo-octahedral weights weigh around 0.35 g. No carat-units that heavy are known in states that used gold coin. This module should rather refer to a doubled unit of 0.175 g. In that case, the Roman-Byzantine carat of 0.189 g (2 x 0.189 g = 0.378 g) is the closest, rather than the heavier Egyptian qīrāṭ of 0.212 g (2 x 0.212 g = 0.424 g) (Grierson 1960:252–4). A different and more credible explanation is that the cubo-octahedral weights were based upon the smaller Arab grain-unit the habba rather than the qīrāṭ. Documentary evidence shows that three habba were counted to the qīrāṭ (Hinz 1955:2; Ridgeway 1892:179). Hinz has calculated a theoretical weight of the so-called Iraqi gold habba of 0.0706 g which would be in accordance with a mitqāl weight of c. 4.23 g (60 x 0.0706 = 4.236 g). The smallest unit amongst the cubo-octahedral weights could then be produced from 5 habba grain-units, if we assume a slightly higher value for the latter than Hinz came to (5 x 0.0708 g = 0.354 g). The heaviest cubo-octahedral weights of around 4.25 g were equivalent to the weight of 60 Iraqi habba.

of the spheroid type are different from those from Scandinavia and Russia in one decisive way. They were solid, and do not show the typical shell of copper alloy around an iron core that is highly typical of the majority of spheroid weights from Northern and Eastern Europe (Steuer 1997:47).

There is some evidence that the spheroid weights with copper-alloy shells were introduced into Scandinavia later than the smaller, cubo-octahedral weights. As Gustin points out (2004c:314), both types of weight are frequently considered together without this point being properly discussed. According to Gustin, the most recent excavations at Birka place the spheroid weights in a later find-horizon than their cubo-octahedral counterparts. At Birka, the small, die-like weights first appear in stratified layers after c. 860 (Gustin 2004c:312–14).[50] She is cautious, however, and unwilling to make too much of this conclusion before the settlement contexts have been examined in more detail. There are, however, other contextualized finds that corroborate her suggestion. At the detector-site of Torksey, England, a large number of die-shaped weights and dirhams, and uncoined hacksilver, have been found, but no spheroid weights (Blackburn 2002). The find-context at Torksey can very reasonably be identified as the camp of the Great Viking Army that settled here in the years 872 and 873 (Blackburn 2002; Kilger, this vol. Ch. 7.6). I believe, then, that these normalized weights may pertain to two different waves of introduction seen in the Baltic Sea region. The cubo-octahedral weights were circulating by the 860s and 870s at the latest in urban settlements such as Birka and amongst the Danish Vikings who were campaigning in England. The introduction of the spheroid weights started probably later, not before the end of the 9th century.

		mitqāl?	Punch-marks	ertogs
1	3.99 g	1 x 3.99	1?	½
2	8.22 g	2 x 4.11	1+1	1
3	22.92 g	6 x 3.82	3+3	3
4	31.37 g	8 x 3.92	4+4	4
5	39.32 g	10 x 3.93	5+5	5

Table 8.8 *The set of spheroid weights from Norelund, Valbo parish, Gästrikland, which respect a module of c. 4 g. Before conservation (Hatz 1974:119; Kyhlberg 1980b:245–6).*

We shall now take a closer look at the weight-set from Norelund, Gästrikland, Sweden, which exemplifies the principles of weighing using the heavier spheroid weights (Fig. 8.18, c.f. Jansson 1936:13). Norelund demonstrates the situation that began to establish itself over the whole of Scandinavian in the 10th century (Hatz 1974:119). The markings on the weights show, as already noted, their relative position within the set, and thus the value of the weight (Kyhl-

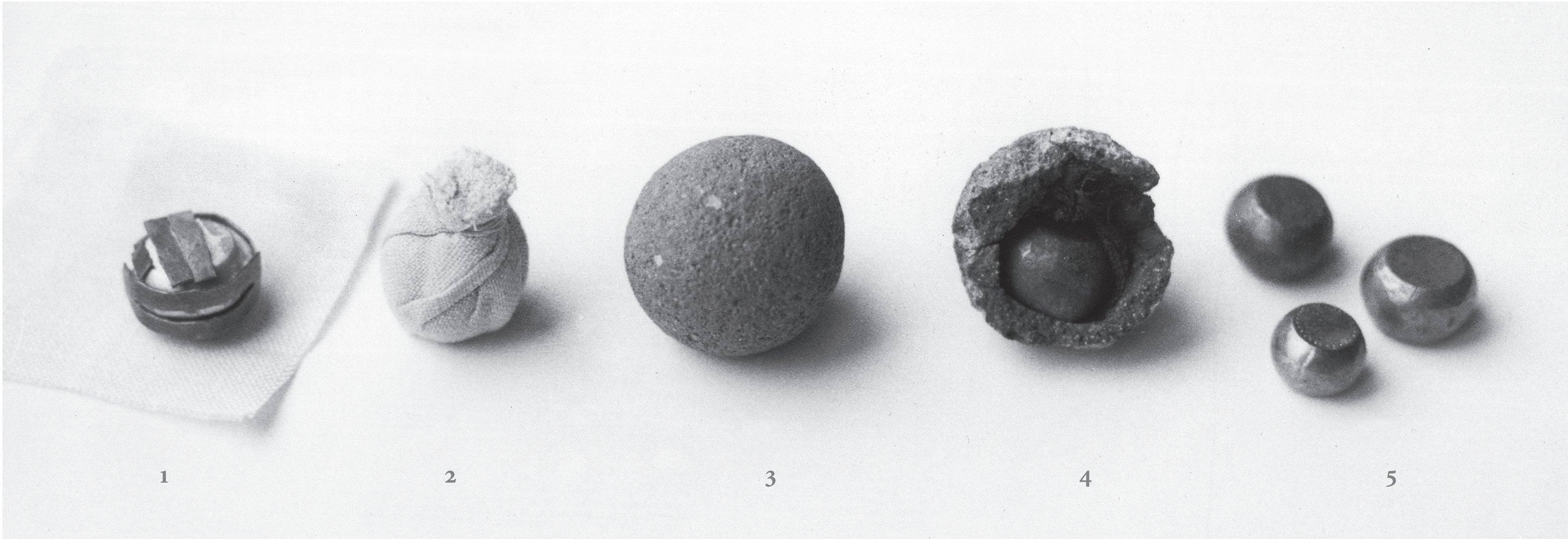


Figure 8.18 *Set of oblate spheroid weights from Norelund, Valbo parish, Gästrikland, Sweden. Photo, H. Andersson, Antikvarisk-topografiska arkivet, Stockholm.*

Figure 8.19 *The stages of manufacture of spheroid weights. Photo, Anders Söderberg.*

berg 1980b:245). This set was calibrated at regular intervals of 1, 2, 6, 8 and 10 units of a module of around 4.0 g (Tab. 8.8).[51] Minor discrepancies were apparently tolerated by those who used sets of spheroid weights. However weights that were considered too heavy or too light could be excluded by double-weighing (see above, p. 305).

It has long been realized that the spheroid weights and the weight-system they represent are congruent with the duodecimal ertog-system we are familiar with from medieval documents from Scandinavia (Arne 1914; Jansson 1936:12–13; Lundström 1973:39–40; Hatz 1974:119). In this, the ertog is related both to the mark and to øre in the ratio of 1 mark: 8 øre: 24 ertogs (see above, p. 280). Thus 1 øre was 3 ertogs (Hatz 1974:118). Brøgger (1921:81–5), in his metrological analyses of Norwegian Viking-period graves with spheroid weights, was able to identify weight-units grouping around 2, 4–5, 6–8, 11–13 and 23–24 g. Minimum modules of approximately 2 and 4 g seem to fit the Scandinavian ertog-system best (see also Pedersen, this vol. Ch. 6.4.1). But what did "ertog" actually mean, and how was this medieval unit of weight and reckoning related to the spheroid weights? We shall examine this in more detail in the following section.

Weights with a copper-alloy shell and pseudo-Arabic characters

The smallest unit of weight and reckoning recorded in Scandinavian documentary sources is the ertog. Just like the *aurar,* there are no references to the ertog outside Scandinavia. The use of the ertog as it is expressed by the law-codes was centred in Eastern Scandinavia (Engeler 1991:144). The origin and meaning of the term "ertog" is unclear. It appears only in legal texts and is never referred to in skaldic or eddic poetry. "Ertog" appears most commonly in Swedish, less so in Norwegian, and very rarely in Danish or Icelandic law-codes. The ertog was also used as a coin-unit only in the Baltic Sea area, from the beginning of the 14th century (Engeler 1991:145).

Hitherto, two etymological hypotheses concerning the origin of the term have been proposed. It is assumed that *ertaug,* recorded in Old Gutnish (= Gotlandic) is the most original form (Engeler 1991: 141–2). *ertaug* is a compound of two distinct concepts. According to one hypothesis, its meaning derives

50 Cubo-octahedral weights were found in the Black Earth within the settlement area in the course of the most recent excavations. A larger number appeared in Phase 6, dated by the bead-chronology c. 860–885. Gustin emphasizes that the weights appear already within the earliest layers (A 50) of this phase (2004c:314).

51 Before conservation, the variance around this module lies in the range of 3.92–4.11 g. There is a discrepancy within the set of 0.29 g between weight no. 4 and weight no. 2. If we ignore no. 2, which is considerably heavier than the other specimens, the discrepancy falls to 0.17 g.

Figure 8.20 *Oblate spheroid weight with pseudo-Arabic inscription. Hedeby. Scale 1:1. 85.23 g. From Steuer 1997:295, fig. 212–1.*

from a common Germanic compound **aruti-taugo,* which can be translated as "metal wire".[52] The other suggestion is that *ertaug* is a loanword of an originally Latin compound *argentum-pondus,* which developed in Germanic to **argentiaR-wagu* and so to **erta-vág* and *ertog,* which would then have meant "silver weight". Sigrid Engeler (1991:142–3) did not regard this hypothesis as convincing since philologically it presupposes a very early use of the word. The interpretations that assume that the term has a very long history base themselves upon the concrete appearance of the form of currency and its primitive role in payment, conceivably as "metal wire" or "bits of metal" by weight. That *ertaug* is used virtually unchanged and undergoes no sound-changes either in West or East Scandinavian also argues, in Engeler's judgment, against a very great age. It is also noteworthy that the Anglo-Saxon texts of the 9th century that refer to the units of mark and øre make no reference to the ertog (see above, p. 280). The linguistic evidence and the written records may indicate that this term first came into use in the 10th or 11th century. I believe that the archaeological evidence supports this.

There is new archaeological evidence of how spheroid weights were made which I consider to shed new light on what "ertog" might mean. Spheroid weights usually consist of an iron core enveloped in a thin metal shell of copper alloy. The copper-alloy shell prevented anyone from manipulating the weight at the same time as protecting the iron core from corrosion which would itself affect the weight. There is now unambiguous archaeological evidence of the complex production process for spheroid weights. Burnt clay fragments known as "melt bowls" with textile impressions have been found in several Viking-period urban contexts, including Hedeby, Birka and Sigtuna (Drescher 1983; Söderberg and Holmquist Olausson 1997). Anders Söderberg (2006: 66–8, fig. 1), who has undertaken a careful study of these distinctive melt bowls, believes that they represent the production of spheroid weights (Fig. 8.19). In the production process, the iron core was covered with thin sheet copper-alloy strips, and then were all wrapped in a piece of cloth to hold them together (Fig. 8.19.1–2). The wrapped bundle was then invested in clay (Fig. 8.19.3). The dried clay ball was then heated up to 1100°C. During this part of the process the sheet copper-alloy melted and ran around the iron core. The textile pouch, which was carbonized in this process, prevented the copper alloy coming into contact with the clay. The weight was then polished, filed and adjusted to the desired weight (Fig. 8.19.5). Melt bowls are, then, the remains of the original clay ball with the carbonized traces of the pieces of cloth and the metals (Fig. 8.19.4).

The metrological connexion between the ertog as a weight-unit and the spheroid weights has, as already noted, been recognized since Ture Arne and Anton Brøgger's studies. But no one has ever attempted to go further, and thus explain why the spheroid weights were associated with this unit. Here I return to the idea I have already introduced, namely that weight-standards like the *aurar*-reckoning, for instance, were conceptualised by being made material. It was precisely the spheroid weights *themselves* that, in my view, were considered to be the standard. The weights *themselves* represent, then, their own reckoning system for weighing silver. As a result they needed their own name, which was presumably provided by "ertog", referring to the typical appearance of the weights.

The Old Gutnish *ertaug* that is first recorded presumably referred to the very distinctive appearance of

52 *aruti is identified as an ancestral form of German Erz, "metal", also found as Old Saxon arut and Old High German aruzzi.

the spheroid weights, and possibly to the technique of coating itself. The philological suggestion that places the compound *ert-taug* at the root is presumably correct, but as yet lacks a satisfactory explanation. German *Erz,* which can also be translated "bronze", refers, in my view, to the characteristic metal shell of the weight. *taug,* which in Old Norse means "rope", "fibre" or "thread", may refer to the textile or the pouch that made it possible to improve the iron core as a weight. It was through the process of refinement in itself that a lump of iron was transformed into a trustworthy weight with the aid of bronze and textile. This process can in turn be interpreted as an act of creation, in which the spheroid weights were animated and turned into living objects.

There is one further argument against the interpretation of "ertog" as "metal wire". The latter is too unspecific to constitute a term for a unit of measurement and weight. The ertog as "a weight with a metal casing" is materially highly specific. It is because it could be perceived as an animated and thus a powerful object that the ertog legitimated the destruction of silver artefacts. In its property of being a standardized object, it made it possible to quantify silver in specific portions. In my view, this more specific interpretation reconciles the significance of the spheroid weights as pieces of weighing equipment, their production, the metrological facts, and the etymology of the word "ertog". But there is further evidence that this type of weight was regarded as a norm in its original period of use.

Several spheroid weights weighing between 100 and 150 g also have inscriptions on the flat upper face that are reminiscent of Arabic writing (Fig. 8.20). This is not true Arabic but rather imitations of Arabic phrases that are also found on dirhams. One phrase is reminiscent of *rasul Allah,* "Allah's prophet", and another of the Arabic *bakh,* which can be translated as "of good quality". The models for *bakh* are found on Abbasid dirhams struck from AD 766–75 (Sperber 1996: 96–7). Here we find an opportunity for a direct connexion between coins and weights. The qualitative properties of the dirham, in terms of purity and weight, were transferred to the weight. The inscription thus legitimated the weighing of silver coins. In Eastern Europe and Scandinavia, the spheroid weights were integrated into exchange relations at the end of the 9th century. Here, these distinctive weights may have been associated with notions of good quality and with reliability when metal was weighed. In that case they had a coin-like, confidence-raising character, and thus assumed a sort of monetary function.

Another suggestion that has been made by Pedersen (2001:26–8) in this regard is that the Arabic writing was imitated with a view to symbolizing access to Islamic silver. Dealing with an object of this kind in public could give its owner social prestige as it signalled to others an ability to gain silver on trading expeditions. Pedersen's hypothesis may explain why the spheroid weights are generally over-represented in burial contexts and may often be found on their own rather than in complete sets of weights in both graves and hoards.

What is clear is that the normalized Oriental weights introduced a different principle for reckoning the quantity of silver from the use of *aurar*-weights. When the dirham hoards start to appear in greater numbers in the North Sea region from the beginning of the 10th century (Kilger, this vol. Ch. 7.1, Fig. 7.1), we see that both the coined and, to a certain extent, the uncoined silver is starting to be broken up. Coins and silver rings in these hoards are manifestly reduced to the substance itself, silver, to be weighed and therefore no longer *themselves* to be counted in terms of nominal units. Thus the silver object lost both its physical and its nominal basis. As I have already argued, silver in Southern Scandinavia in the 9th century, in the physical form of rings and ingots, was bound within morphologically recognizable and therefore acceptable forms. But this *morphological identity* and the immaterial associations intrinsic to the physical form of the ring were neutralized by fragmentation. The object of trust was moved from one side of the pair of scales to the other: in other words, from the silver items of standardized weight such as coins and rings to the ertog. It was by means of the ertog that silver could leave its morphologically fixed and significant form and turn into hacksilver. It was through the ertog that "hacksilver in itself" became a medium of exchange. An economic value was thereby defined in a completely different way from *aurar*-reckoning. The silver fragments had no soul or spirit and so were not objects of value any more. The connotations of value and calculability that were previously linked to physical objects such as coins, rings and ingots had been abstracted and transferred to another object that replaced them, the weight. This replacement, I believe, may have triggered off a revolutionary process of change in the conceptual and cognitive worlds by which the value of the metal became inseparably linked to a conceptual understanding of the normalized weight. We shall now look at another source of evidence that has been associated with the process of fragmentation, namely the so-called hacksilver hoards that first appear during the first half of the 10th century all over Scandinavia.

A new time of threat: the fragmentation of silver objects

Birgitta Hårdh (1996:93) has studied fragmentation within Viking-period silver hoards and the regional development of the phenomenon of hacksilver. Very recently she has also examined the fragmentation of silver in settlement contexts such as Kaupang and

Figure 8.21 *The hacksilver hoard from Cuerdale, Lancashire, NW. England (t.p.q. 905). Photo, The Trustees of the British Museum.*

Uppåkra (Hårdh, this vol. Ch. 5.5.1). According to her definition, in a hacksilver hoard at least 50% of the uncoined objects weigh less than 5 g and at least 50% of the objects have to be fragmented. This allows her both to quantify and to date the development of fragmentation within the mixed hoards of the Baltic Sea region and in Scandinavia. Hacksilver hoards meeting Hårdh's definition first appear in South-Western Scandinavia, in Jutland and the Viken area, at the beginning of the 10th century (Lundström 1973: 21, tab. 3.1; Hårdh 1996:92–3, fig. 21, tab. 12 and 94–130, fig. 27).[53] A methodological premiss of Hårdh's studies (1996:84) is the development of a diagnostic means of studying the regional development of the process of fragmentation and thus also of the use of silver as a form of currency. Fragmentation represents a higher level of use of silver over a range of transactions than with silver which is bound up in larger, complete objects such as, for instance, rings or coin. Hårdh sees the changing use of silver in different hoard-areas as evidence of different economic systems.

Hårdh also brings out a number of essential points about how one may interpret fragmentation. Fragmentation gives us an insight into the circulation of silver and with that an idea about the extent of economically motivated transactions in a given region. Another line of thought is that the degree of fragmentation is an indirect indication of access to silver in an area. Put differently, fragmentation is intensified in an area when the price of silver rises. As a third perspective, the practice of fragmentation can be regarded as a stage in a process that leads to the use of coins as currency. Hacksilver may show us that access to coin was insufficient and unable to satisfy the need for currency. Hårdh thus allows us to consider the pieces of hacksilver as nominal and monetary units in a situation of general shortage. Hacksilver can therefore be seen as an intermediary stage between barter trade and a monetized economy. This is the case even though coins were *de-nominalized* and could simultaneously be used as weighed silver (Hårdh 1996:86; Kilger 2000:117–18). The explanation of exactly why the hacksilver tradition emerged in Southern Scandinavia at the beginning of the 10th century is, in Hårdh's view, the proximity of the monetized and economically highly developed Carolingian realms. Contacts with the monetized site of Hedeby will also, in her model, have promoted payment in very small quantities of silver (Hårdh 2004:215–16). As a result it should also have become possible to trade mundane, day-to-day products (Hårdh, this vol. Ch. 5.4).

A similar set of ideas has been propounded by Ralf Wiechmann (1996:173–8). Wiechmann, however, goes a step further than Hårdh. According to him, coin-fragments may themselves be adjusted to various basic monetary-units and to the average weights of Continental issues such as Carolingian, Scandinavian, Anglo-Saxon and German coins, and dirhams. A coin-fragment should, then, have the monetary function as a piece of minted silver. If we accept Wiechmann's train of thought, the hacksilver regions would be practising an earlier and more advanced system of reckoning and payment than the monetized territories themselves. This seems implausible. It is also unclear how, in such circumstances, one was supposed to be able to distinguish between, for instance, a third and a quarter of a coin in the actual situation of payment, or which fragments observed the Carolingian, Anglo-Saxon or German coin-standards respectively; and, how far the nominal use of hacksilver could be reconciled with the effective rules of a weight-economy (Kilger 2000:120–1). Something that on further reflection also argues against a quasi-monetary use of hacksilver is the fact that the partition of coins with a view to creating smaller nominal entities is not evidenced in Western Europe before the end of the 10th century. At the end of the 9th century and in the first half of the 10th the striking of *obols,* or half-coins, corresponding to half a penny, began in England.[54] In the German realm, half-

53 The West Slavonic lands and the South-East of mainland Sweden followed suit in the middle of the 10th century. The regions north of Mälaren, in Southern Norrland, have typical hacksilver hoards first at the end of the 10th century. On Gotland, a tendency to fragment uncoined silver appears from about AD 940, but really breaks through only at the beginning of the 11th century.

54 There is evidence of struck halfpennies for, inter alios, Coenwulf II of Mercia (874–80), but such half-coins were struck first and foremost under Viking rule in York at the end of the 9th century. It was only after Edgar's coin reform of 973 that the official clipping of pennies to produce halves and quarters (halfpennies and farthings) began (Jonsson 2004:2–3, fig. 6).

denars and obols were regularly struck during the 10th century and later, as in the Dukedom of Oberlothringen. However here too, as in England, in certain circumstances the practice of clipping coins began in the late 10th century (Jonsson 2004:3 and 8–10, fig. 7, tab. 2).

It is clear that the partition of coins practised was not an accepted procedure in the monetized areas of Western Europe any more than it was in the Caliphate, be that in official circles or amongst those who had to use the coins (see above, p. 303). I conclude, therefore, that when the clipping of coin began in Western Europe it was on the basis of a change in attitude towards coined silver and in the principles that defined a monetary value. The inspiration for this change in attitude may rather have come from Scandinavia to the West, not the other way around as Wiechmann and Hårdh have proposed. The clipping of coin in England and Germany seems, indeed, to coincide with the importation of German and Anglo-Saxon coins to Scandinavia in the second half of the 10th century (Jonsson 1990). There may be a link here too. The fragmentation of silver in Scandinavia in the Viking Period first affects the dirhams and later spreads over to other, uncoined objects (see above, note 46). When the fragmentation of whole objects such as ring silver began, hacksilver finds appear. This is the process that Hårdh has been able to explicate in her studies.

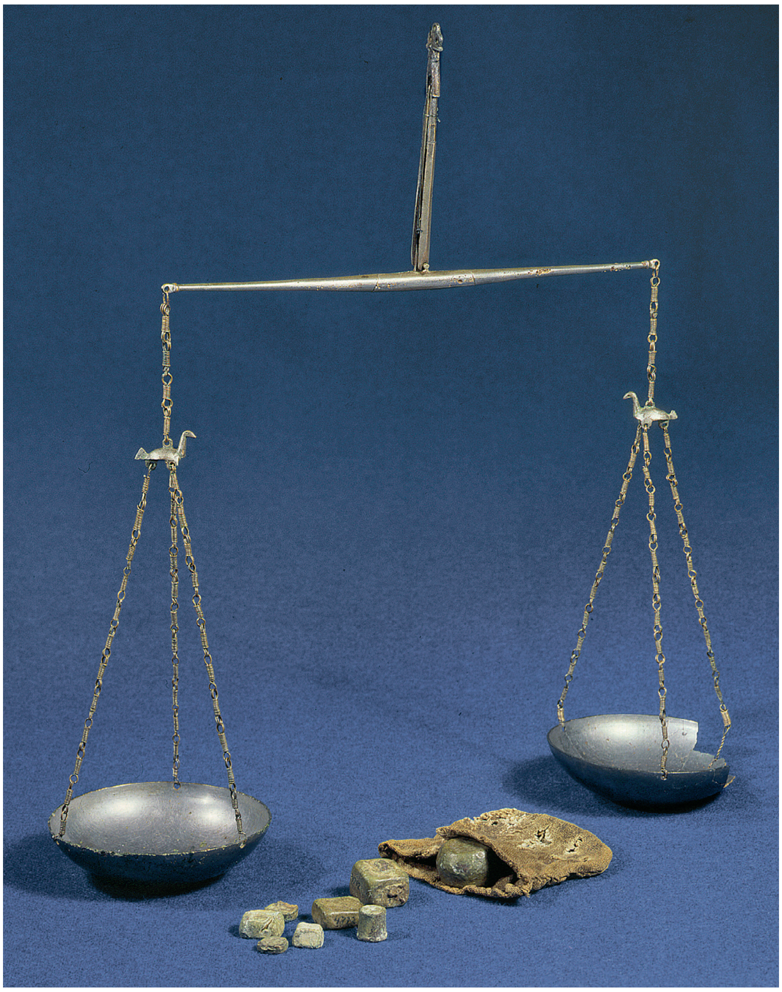
In my view, the beginning of the hacksilver phase implies a period of revolutionary changes all over Scandinavia. During this period of transition certain groups who were engaged in long-distance trade may have been prepared to abandon the trusted *aurar*-objects for a different principle of reckoning and valuation which went with the normalized weights. The use of those weights was not evenly spread geographically, but rather seems originally to have been regionally concentrated. In the same way, we can suppose that the use of hacksilver as of equivalent value was originally very narrowly restricted to the trading sites. The tendencies towards this Orientally derived ideology of fragmentation can perhaps be observed in the middle of the 9th century when cubo-octahedral weights came into use at Birka, but it first really broke through right across Scandinavia with the spheroid weights in the course of the 10th century. It was with the spheroid weights that one could weigh large quantities of hacksilver. One of the earliest examples of the use of spheroid weights may come from the beginning of the 10th century in the lands around the Irish Sea in the large hacksilver hoards from Cuerdale in the North-West of England (Fig. 8.21) and Dysart Island, Ireland. These contained a larger numbers of dirhams, but also uncoined silver that was fragmented to some extent (Graham-Campbell 1992a:10–11, 1992b:112–13; Keynes 1999:63; Sheehan 1998:169–70). The quantity of fragmented objects in these hoards clearly denotes a change in the handling of silver and may indicate that much greater amounts of hacksilver were being passed through the scales than before. An area of innovation in Scandinavia with respect to the use of spheroid weights may be detectable in Jutland in the first quarter of the 10th century, where the earliest Scandinavian hacksilver hoards are found (Hårdh 1996:95–6). But before I proceed further with a sketch of the breakthrough of the concept of hacksilver in Viking society and its possible social consequences, I shall take a closer look at the practice of weighing that was present before – and chronologically alongside – the use of the normalized weights. This is the lead-weight tradition, which may run back to the Early Iron Age in Scandinavia (Pedersen, this vol. Ch. 6.2.2). The question I shall examine in the next section is how lead weights may also have been used as weighing equipment in the calculation of fragmented silver.

One set and two systems of weights

The archaeological work at Kaupang has more than doubled the number of Viking-period weights known from Norway. From both the settlement area and the cemeteries around Kaupang we now have a total of 420 objects that have been identified as weights (Pedersen, this vol. Ch. 6.1.1, Tabs. 6.3–4). Other than at Kaupang, about two hundred weights from the Viking Period have been recorded. In the settlement area lead weights predominate at more than 82% (338 specimens) compared with 16% for the copper alloy weights (72 specimens). In the cemeteries around Kaupang, by contrast, only 10 weights have been found, all of which are of the normalized type of copper alloy or with a copper-alloy shell (Pedersen, this vol. Ch. 6.1.1, Tab. 6.3, Fig. 6.13). The transitional phase in which the lead weights went out of use in the regions of Norway is difficult to identify as we have largely to refer to poorly dated burial contexts (Pedersen, this vol. Ch. 6.2.2–3). But the large number of lead weights in the settlement area may indicate that these were still in use at Kaupang in the early 10th century when the normalized weights were beginning to become established as trading equipment in several parts of Scandinavia. A minority of the lead weights which are similar in shape to the normalized weights indicate that both types of weight were used side-by-side in the town (Pedersen, this vol. Ch. 6.2.3, Fig. 6.16). It has formerly been argued, that the lead weights with metal appliqués were calibrated in øre (see pp. 285–6); but how are we to interpret the large number of weights that weigh less than an øre? What system of weights was observed by the lead weights that weigh less than one whole, or half, an øre: less than 26 or 13 g respectively?

Metrological analysis of the lead weights from Kaupang reveals that many of the weights seem to be calibrated around units of 4 and 8 g (Pedersen, this

Figure 8.22. *Weight-set from Jåtten, Jæren, Southern Norway dating to the 10th century, with lead weights and a tin-plated balance (B4772). Photo, Svein Skare, Bergen Museum.*



vol. Ch. 6.3.3, Figs. 6.18–19). These amounts are supposed to agree with the Islamic *mitqāl* and the Scandinavian *ertog* respectively. It is also possible to identify clusters around 2, 12 and 24 g, which could be fitted to Brøgger's later øre-system. According to Brøgger, the original øre underwent a slight reduction in weight from c. 26 to c. 24 g in the course of the Viking Period (1936:78–9). He distinguished, as a result, between an earlier and a later øre. The later øre was divisible into 3 ertogs, which was not possible with the earlier øre-system. At first sight, it would appear possible, therefore, to argue that the lead weights from Kaupang are similar to the normalized weights in many respects. They were used to weigh and to value hacksilver and they seem to respect Brøgger's later øre-system.

Since all of the weights from Kaupang are individual finds, it is not possible to study the original calibration code that the weights followed within their original sets. As has been shown above using the finds from Bråten and Kiloran Bay, the analysis of complete weight-sets makes it possible to study the minimum common factor within a set. It is also possible to obtain information on the intervals of calibration that determine the relative positions of the weights within the set. The find from Jåtten (Fig. 8.22, Tab. 8.9) in Jæren in South-West Norway – a hoard, to judge by the records of the find – contained a complete set of eight lead weights.[55] In this well-preserved and whole find all of the contextual information is available that is needed to determine what system of weights any single weight may relate to. Together with the weights, which were wrapped up in a small textile pouch, there was also a very well-preserved, tin-plated balance with its own case richly decorated with patterns of the Celtic style. This type of tin-plated balance with chains is only known from the North Sea area, with a particular concentration in Western Scandinavia (Steuer 1987:462, fig. 6a, 1996: 23–4, fig. 3). The distinctive type of balance dates the Jåtten find to the 10th century. Jåtten should therefore be useful as a possible model to shed light on the lead weights found at Kaupang. Let us take a closer look at the structure of this complete set of weights (Tab. 8.9).

Three weights from the Jåtten seem to have been calibrated to the earlier øre-standard using a coin of 1.34 g to 1 and ½ øre (nos. 2–3). However four of the lighter weights are calibrated to a basic module of approximately 2 g (nos. 4–7). There is no known standard coin that corresponds to this weight. A different object may then have been used which was considered to have a consistent weight. One possible candidate would be the cubo-octahedral weights. Comparative studies of a large corpus of these show that those specimens with 3 punchmarks cluster from 2.47 to 2.17 g (Steuer 1997:284, fig. 204). Cubo-octahedral weights with this marking would be closest to a unit of around 2 g.

However there is an alternative and perhaps more plausible explanation that would also correlate all of the weights in the set metrologically to a common

55 B4772.

		coin?		*aurar*			grain (à 0.067 g)
1.	2.68 g	1.34	x 2				40
2.	13.45 g	1.34	x 10	½			200.7
3.	26.80 g	1.34	x 20	1			400
				mitqāl / ertogs unit?			
4.	1.96 g	1.96	x 1	½	¼		29.3
5.	4.04 g	2.02	x 2	1	½		60.3
6.	5.99 g	2.00	x 3	1½	¾		89
7.	7.66 g	1.91?	x 4	2?	1?		114?
				aurar / mitqāl / ertogs unit?			
8.	40.34 g	2.01	x 20				
		1.34	x 30	1 ½	10	5	602

Table 8.9 *The set of lead weights from Jåtten, Hetland, Southern Norway (Brøgger 1921:4 and 15).*

unit. All of the weights could be calibrated by means of the grain. If we recalculate the metric weights in numbers of grains, the entire set shows very high precision in calibration (Tab. 8.9). The minimum common factor for all weights is a grain of 0.067 g. This precision argues against the use of any larger object such as a coin or cubo-octahedral weight by which to calibrate. The weights that observe the earlier øre-standard are calibrated in terms of a vigesimal system (see above, p. 284). It is possible that weight no. 1 was produced first with 40 grains. Afterwards this weight – in order to simplify the procedure – could have been used to calibrate the two larger weights at ½ and 1 øre respectively. But weights Nos. 4–6 are calibrated according to a trigesimal system that could not be employed with the earlier system of reckoning in øre. The number 3 appears as a coefficient in a duodecimal system of reckoning, such as is found, for instance, in the Roman, Byzantine and Islamic systems of coinage. Weight no. 7 may have been damaged, as it departs slightly from the trigesimal pattern. It was perhaps originally meant to weigh 120 grains, which would give a value of around 8 g. Weight no. 8 which weighs around 40 g or 600 grains seems to represent the maximum consistent unit in the set. This weight could have been produced using weights Nos. 2 and 3 or by doubling weights Nos. 4, 5, 6 and 7 together.

The pattern of calibration suggests that the owner of this set wanted to be able to deal with precious metal according to two different systems of weights. The smallest unit that could be weighed and valued with this set was 2 g or 30 grains. It is interesting that the heaviest weight is calibrated to fit both systems. This weighs 1½ øre or 600 grains according to the older Scandinavian øre-standard. This unit was directly compatible with the Islamic mitqāl- and the Scandinavian ertog-systems, at 10 mitqāl and 5 ertogs. Using the set of weights from Jåtten, it was thus possible to measure the same amount of silver according to either the earlier or the later øre-standard. It was particularly with weight no. 8 that it was possible to calculate a larger quantity of silver using both weight-standards. The scope for recalculation also renders it highly likely that this weight-set was used to weigh fragmented silver rather than whole objects. But what system of weights is represented by the smaller weights, calibrated at intervals of 2 g? Or, to look at this from a Viking-period calibration perspective, was there a system of reckoning that made use of 30, 60, 90 and 120 grains to produce recognized units of weight? There is a real possibility that this was so.

The Syrian-Arab mitqāl-unit was reckoned as 20 qīrāṭ, or 60 habba-grains (Hinz 1955:2; see above, note 49). The weights would therefore be consistent with the intervals we are familiar with from reckoning with the Islamic mitqāl. Rather than an Iraqi habba, which weighed around 0.071 g, lighter Scandinavian types of grain available to the person who manufactured the set of weights were used. As we have seen, the grain used for calibration for the Jåtten set weighed 0.067 g. This produces an overall reduction of the weight of the mitqāl from 4.26 to 4.02 g.[56] Erik Sperber has come to a similar result in his studies. From a metrological study of the spheroid weights, he has concluded that the Islamic mitqāl-unit was followed on Gotland. In mainland Sweden, at Birka, by contrast, a lighter module of 4.0 g was used, which he calls the Swedish-Islamic unit (1996: 85 and 110–11).[57] Sperber was unable to explain this conspicuous difference, but from the viewpoint of weighing in grains such a reduction in weight is a

56 4.02 g = 60 x 0.067 g; 4.26 g = 60 x 0.071 g.

57 As a sub-module of the so-called Swedish-Islamic standard of 4.0 g, Sperber reconstructs a unit of 0.8 g. The Islamic mitqāl-system at 4.26 g, by contrast, was based upon a sub-module of 0.71 g (Sperber 1996:87). What is inconsistent and confusing in Sperber's model is that in the case of the Birka system he assumes a division into 5 units (4.02 g/5 = 0.8 g), while he reckons with 6 units to the Islamic standard mitqāl (4.26 g/6 = 0.71 g). Sperber's otherwise outstanding metrological analyses would fit better if the Birka system were likewise based upon a duodecimal number of 6 and a much smaller sub-module (4.02 g/6 = 0.067 g). This would match the grain-unit inferred from the weight-set at Jåtten. The key to understanding Sperber's Swedish-Islamic module is that the same intervals of calibration were used as in mitqāl-reckoning, but a lighter grain was applied in copying this in Scandinavia.

familiar practical consequence of weights being calibrated using local types of grain.

The small lead weights from Jåtten presumably observed the same idea of calibration as is represented by the cubo-octahedral weights. According to Ingmar Stenroth (in prep.), the cubo-octahedral weights are based upon a 60-grain system that is divided into 12 units. Each unit, marked with one punchmark on the weights, corresponded to an interval of 5 grains. In theory, then, 30 grains would be the same as a cubo-octahedral weight with 3+3 punchmarks. As I have noted already, however, the cubo-octahedral weights with this number of punchmarks are usually heavier, so that they themselves could not have been used as prototypes for calibration. Rather it may have been the counting system itself that the cubo-octahedral weights were based upon, and reckoning in grains, that were accepted. If we pursue these observations on a more general level, a basic unit reckoned as 60 grains would be the definite link between cubo-octahedral weights and oblate spheroid weights. Using the cubo-octahedral weights one could reckon in fractions of the unit of 60 grains, and using the spheroid weights in multiples of that unit. This basic unit was presumably also used in the production of the Southern Scandinavian lead weight sets at the end of the 9th and beginning of the 10th centuries. The lead weights from Jåtten not only provide us with an insight into how calibration was done but also into how fragmented precious metal was measured in small portions.

From the point of view of the user of the weights, it was important that the weights in the set were perfectly consistent with one another. Outside of the set of weights and the intrinsic calibration code that determined the use of the weights within the set, the lead weights that imitated the Islamic mitqāl-unit could not be separated from weights in lead which followed the older øre-standard. Jåtten shows too that the *aurar*-standard based upon gold coin did not disappear in the hacksilver period. This find can consequently be interpreted as a hybrid set of weights, the use of which made it possible to reckon fragmented silver in terms of two different standards. This was probably a pragmatic necessity when fragmentation really established itself in exchange relations in the 10th century. A high proportion of the lead weights from Kaupang may then have been used in the same way as the weight-set from Jåtten. It was also in Kaupang that there was a need to be able to switch between payment using hacksilver and payment using larger, whole *aurar*-objects such as ingots. This may provide us also with an explanation of why lead weights predominate in the settlement site and why they were not immediately displaced by the normalized weights. This ability to switch between two standards was not so easily offered by the normalized weight-sets. What the basic unit of 60 grains – with its similarity to Islamic mitqāl-reckoning – was called in Scandinavia we do not know. In the following section I shall offer a conceivable answer.

Wholeness, holiness and dissolution

In the saga of Harald Greycloak in Snorri's *Heimskringla,* the final section narrates the fate of the skaldic poet Eyvind *skáldaspillir* [= "robber of poets"] (trans. Johansson 1991:185–6). This episode is set in the 960s, when Eyvind was forced to take care of himself after the death of his patron, King Hakon the Good. The poet had been given a gift from all the Icelanders after having composed a *drápa* in their honour. Each Icelander contributed three pennies of pure silver in payment. At the Althing it was decided to honour him with a gift that would make the silver finer still. The silver was made into a cloak-brooch equivalent in value to the huge sum of 50 marks of silver. But after Eyvind had the gift sent from Iceland, he broke the brooch up in order to buy himself a farm. The saga also tells of a great famine that afflicted Norway and of snow lying on the fields in the summer. Eyvind and the people of his farm were suffering too, and they put out to sea to fish. The purchase of the farm had cost the poet everything, and he was forced to pay for herring with his bow and arrows. In the final stanza that is quoted by Snorri, the great poet expresses his remorse at having squandered not only the Icelanders' beautiful gift but even his arrows. This composition reveals the conflict that had been dominating Eyvind's thoughts since he had broken up such a valuable and personal gift in order to buy a property. His personal situation and his responsibility as leader of his household compelled him to take that drastic step. This episode may also indicate that the fragmentation of a beautiful silver brooch in order to use it as currency was a feasible practice in Eyvind's day. Although the saga was composed much later, in the 13th century, it evidently reproduces a knowledge of a method of payment that was current in the 10th century amongst a wide swathe of the population. Fragmentation was an option of which even famous but powerless chieftains such as Eyvind could make use. This is the mental change in general perception that I believe we can also read in the hacksilver hoards that started to spread throughout Scandinavia in Eyvind's time.

The ambivalent attidude that people held towards hacksilver is also expressed in the Icelandic law-code *Baugatal*. In *Baugatal* the various components that made up a fine to pay for manslaughter were specified (trans. Dennis et al. 1980:175). These were the ring, *baugr*, as a larger unit, and smaller units that are referred to as *baugþak* and *þveiti*. Morphological identity is still recognizable in *baugr* and *baugþak*. What, though, does *baugþak* mean? The word is a compound of *baugr* and *þak*. *þak* can be translated as "roof" or "covering". The related verb *þekja* means “to increase a sum by adding to it” or “to contribute to a price or fine” (Engeler 1991:90). *baugþak* may then refer to the small rings that are linked around the larger rings: pendant rings. An example of a ring that corresponds to the normal fine and the various units that are noted in *Baugatal* has been found in a hoard from Krapperup in Skåne (Hårdh 1976:39 and 106, tab. 22:II). This hoard comprised two rings: a plaited neckring and an armring. Linked to the smooth armring were seven smaller rings (Fig. 8.23, c.f. Hårdh 1976:tab. 22.II). Four of these smaller rings in turn had dirhams fastened around them. The whole assemblage weighs c. 100 g, corresponding to approximately four units of the earlier standard øre. Both the rings and the coins may, then, be understood as *baugþak:* supplements adjusting the weight of the main compensation-ring, which may have been a plaited neckring. If both the rings and the coins from Krapperup together should be identified as *baugþak,* then each corresponds to the weight that is stipulated for the second ring in *Baugatal,* namely half a mark or about 100 g (Tab. 8.10). But *Baugatal* goes on to state that the sum of the fine is to be made up with *þveiti* in addition to the *baugr* and *baugþak.*

The heaviest of the four compensation-rings is paid by the kin of the miscreant to the closest kinsmen of the man who has been killed, father to father, son to son, or brother to brother (trans. Dennis et al. 1980: 175). The ring weighs 3 marks, and in *baugþak* a sum of 6 øre is given too. However the family must also pay an additional sum of 48 *þveiti*. *þveiti* are also referred to with the other three compensation-rings (Tab. 8.10). *þveiti* are clearly some distinct entity that is not reckoned in marks or øre. The fines due in *þveiti* seem also to follow a duodecimal reckoning that is divisible by the numbers 4 and 8. Could it be that the Icelandic *þveiti*-units represent an Icelandic and West Scandinavian counterpart to the ertog-system? What does *þveiti* actually mean?

þveiti are also named as a unit in the earliest Norwegian laws (Storm and Hertzberg 1895:750). The term is usually translated as “pieces” or “fragments”. Etymologically, *þveiti* is related to the Norwegian

	ring	***baugþak***	***þveiti***
Ring 1	3 mark	6 øre	48
Ring 2	20 øre	½ mark	32
Ring 3	2 mark	3 øre	24
Ring 4	12 øre	2 øre	16

Table 8.10 *Compensation-payments specified in* Baugatal *in units of marks, øre and þveiti.*

Figure 8.23 *Silver armring with baugþak from Brunnby, Krapperup, Skåne (t.p.q. 913) (Hårdh 1976:106, pl. 22:II).*

word *tveita* and Swedish *tveta,* meaning “cut”, “cleave” (Hellquist 1980:1251–2). In Old English the verb *þwitan* is found, meaning “cut”, “cut off” (Engeler 1991:90–1). *þveiti* has been interpreted as a very small coin-unit or cut coin (Storm and Hertzberg 1895:750). The clipping or partition of coins is very common with Anglo-Saxon pennies from the end of the 10th century onwards. But there is no unambiguous evidence that partition was also practised with Norwegian medieval coins (S. Gullbekk, pers. comm.). There is therefore scope for suggesting an interpretation of *þveiti* as “fragment” or “fragmented silver”.

As I have suggested above, the heavier spheroid weights were probably given their own particular name as ertogs. “Ertog”, then, referred both to the very distinctive and readily recognizable type of weight and to a unit of weight. Using this term it was possible to specify and to calculate large quantities of fragmented silver. We do not know, however, what the smaller cubo-octahedral weights were called in Scandinavia, as no units smaller than the ertog, in other words lighter than about 8 g, were codified and preserved in the weight- and reckoning systems of the High Middle Ages. The ertog was the smallest unit of reckoning. The find of lead weights from Jåtten shows that silver was dealt with in portions of 60 grains (see above, p. 314-15). This is the equivalent of an Islamic mitqāl or half an ertog. This, perhaps, is the unit that was referred to by the term *þveiti.*

It was probably with the cubo-octahedral weights that fragmented dirham silver was processed in the 9th century. The centres for the use and diffusion of these small weights in Northern Europe may have been urban settlements such as Birka. It is at Birka that we have, as yet, the earliest dates for this type of weight (see above, p. 307, note 50). We must remember, however, that the finds from Birka may date the beginning of their use in the town, and not necessari-

ly the absolute introduction of the cubo-octahedral weight as an item of weighing equipment in the Baltic Sea area. The possibility cannot be excluded that other sites with even earlier dated examples may turn up.[58] Using these special weights, which were normalized both in form and in weight, it was possible to weigh and divide silver into portions according to a different, previously unknown, scale. The use of cubo-octahedral weights in transactions made it thinkable for the trading parties to deal with body-less or *amorphous* silver in small quantities. It is this process, I believe, we can read from the term *þveiti*. The use of *þveiti* in exchange relations involved the splitting and so the dissolution of wholeness. The term *þveiti* manifestly refers to the object-free condition of silver: the non-morphological state that fragmentation brings with it. As a unit of reckoning, *þveiti* implies a certain quantity of fragmented silver, while in a transferred sense the term probably also reflects the dissolved wholeness and the partition of the silver's intrinsic value. *Þveiti* may be a Scandinavian word for the Islamic weight-unit *mitqāl,* and for the system of reckoning the mitqāl represented. In terms of Viking-period weighing and valuation, then, *þveiti* should be understood as the basic unit for fragmented silver.

The fragmentation of coined and ring silver that began to become common throughout Scandinavia in the 10th century can therefore be viewed from a different perspective. The breaking up of silver objects can perhaps be seen as an act of *sacrilege* against the principle of the bodily *wholeness* of the coin, ring or ingot, and so too against its intrinsic *holiness.* Established conventions of payment that were based upon *aurar*-objects were challenged. For those who were accustomed to think and to reckon in *aurar,* this fragmentation may have represented a state of chaos in which the intrinsic quantitative relationship betweens coins and rings was dissolved. The system of *þveiti* and ertogs based upon fragmentation could have been seen as an assault upon the principle of value that was embodied in coins, rings and ingots.

However the transformation of fragmented metal objects to whole ones and back again was practised all through the Iron Age. The practice of breaking objects up was not necessarily introduced along with normalized weights in the 9th century. Late Roman

58 One possible candidate is the settlement at Janów Pomorski on the southern shore of the Baltic in the Old Prussian territory (Jagodzinski and Kasprzycka 1991). The archaeological studies of the last few years have produced a large number of individual finds of dirhams here (Bartczak et al. 2004). About four hundred weights have also been found, the majority of which are the cubo-octahedral type (M. Bogucki, pers. comm.). In the Old Prussian and West Slavic lands there is also a large number of dirham hoards that are amongst the earliest in the Baltic Sea area (Kilger, this vol. Ch. 7.5).

Iron-age metal hoards consisting of silver fragments are known from, amongst other places, Gudme on Fyn (Thrane 1993:36, pl. 10). What constituted a decisive qualitative difference was that the fragments could be used as a token of value in various transactions of economic character. The development to hacksilver as a calculable substance of value did not happen all at once but, rather, was presumably first established locally, where the conditions were right. The centres of this innovation in economic life in Scandinavia were probably the early urban trading sites such as Birka and Kaupang. This was also, perhaps, the case at Hedeby for a while, where the striking of Scandinavian coins was suspended during the second half of the 9th century (Malmer 1966:212–9 and 246–7). To conclude, I shall now try to pick out various details that I have referred to earlier on in this chapter to form a coherent picture of the various stages of the hacksilver economy in Southern Scandinavia and the North Sea zone.

The early use of hacksilver around the North Sea and at Kaupang

It may have been at Kaupang that a silver economy based upon hacksilver first appeared in Viken. The Orientally inspired practice of fragmentation that was based upon the use of normalized weights was able to establish an initial foothold in the market area at Kaupang which was a meeting place for long-distance trade. But when did that happen? There is, as yet, no concrete archaeological evidence of when the use of the normalized weights may have been introduced to Kaupang. We have no surviving stratified layers later than c. 840/50 (Pedersen and Pilø 2007: 185, fig. 9.2). The date of introduction may have coincided with the first importation of large quantities of Abbasid dirham silver to the settlement area in the second half of the 9th century (Blackburn, this vol. Ch. 3; Kilger, this vol. Ch. 7.9). The practice of valuing and reckoning fragmented silver presumably came with the dirhams. As I have already noted, it was dirhams that appeared first as fragmented objects in the silver hoards (see above, p. 303). The widespread fragmentation of dirham silver can be observed in the earliest dirham hoards of the Baltic Sea zone. This is the case, for instance, with a number of Gotlandic finds from the first half of the 9th century (see above, note 46). If we move over to the North Sea region, the practice of fragmentation and the use of dirham silver seem not to be in evidence until a later date. A very good example is the metal-detector site at Torksey, Lincolnshire, in the North-East Midlands of England. Here the combination of the use of fragmented dirham silver, cubo-octahedral weights and uncoined hacksilver is very clear (Blackburn 2002).

Torksey was, according to documentary sources, the camp site of the great Viking army that conquered much of England. This army apparently camped here for twelve months in the years 872–3. The finds from Torksey are apparently interpretable as the earliest evidence of an economic practice that made use of hacksilver, albeit on a small scale, in the western North Sea region. Besides 16 cubo-octahedral weights, a large number of lead weights has been found, including conical weights, inlaid lead weights, and weights with metal appliqués – all of which have also been found at Kaupang (Blackburn 2002:98–9; Pedersen, this vol. Ch. 6.4.4). The use of cubo-octahedral weights at Torksey indicates that hacksilver could have been dealt with in very small units. The smallest weight is only 0.86 g (Blackburn 2002:97, tab. 1). The dirham-fragments are also very small. Of the eleven specimens published hitherto, nine weigh between 0.18 and 0.60 g. Two fragments weigh 0.8 and 1.6 g respectively (Blackburn 2002: 92–3). Without the metal-detector finds from Torksey we should have had no knowledge of this practice of fragmentation, since hacksilver has left practically no traces in the other coin hoards deposited in England during the last quarter of the 9th century (Blackburn 2003). One exception is the small hoard from Croydon near London, which contained a few fragments of ingots and armrings (Graham-Campbell 1992b). In Northern Friesland a further hacksilver hoard of Viking-period character has been recorded on the island of Wieringen (Besteman 1999; Kilger, this vol. Ch. 7.6, Fig. 7.18). The hacksilver finds from Croydon and Westerklief II were apparently deposited in the 870s and thus are contemporary with Torksey (Kilger, this vol. Ch. 7.6, Tab. 7.11). Looked at in a larger geographical and chronological perspective, however, all three of these finds are isolated. It is only from the beginning of the 10th century that hacksilver hoards begin to be especially evident in the British Isles (Fig. 8.21). In this respect, the situation in England is like that encountered in Southern Scandinavia. The hacksilver and dirham hoards are, with a few exceptions, conspicuous by their absence in the 9th century and enter the scene in the 10th (Hårdh, this vol. Ch. 5.4; Kilger, this vol. Ch. 7.1, Fig. 7.1).

The connexion between the use of hacksilver as currency and the use of cubo-octahedral weights in the 9th century seems to be corroborated by the collection of finds from Torksey. Pedersen, (this vol. Ch. 6.4.2, Fig. 6.29), argues that the lead weights may have been used to weigh and value hacksilver. Her contextual studies of the most recent excavations in Kaupang show that the distribution of lead weights and hacksilver can be related to one and the same plot. This context is dated to the second quarter of the 9th century, which would then imply a very early use of hacksilver in Kaupang. But were the conditions met for the lead weights also to have fulfilled the same function as, inter alia, the cubo-octahedral weights?

As we have already seen, using what was found at Jåtten, it would have been possible to use the originally Islamic system of reckoning by mitqāl-units to produce a set of weights. The know-how in respect of the matrix of reckoning that thus materialized in the cubo-octahedral and spheroid weights was transferred in the Jåtten set to another material, lead. Erik Sperber's metrological analyses (1996:72–4) of lead weights from the trading site of Paviken on Gotland reveals that reckoning by mitqāl may have served as the matrix for their production too. Pedersen's metrological studies (this vol. Ch. 6:146–8, Tab. 6.9) give further support to this possibility, as some of the lead weights with secure context may have calibrated to the þveiti/ertog-system. Both the hacksilver and the lead weights seem, furthermore, to have been used in association with the building that stood on this plot (Pedersen, this vol. Ch. 6:162). But why, then, do we not find normalized weights and dirhams in the same layers? The very early dating of the context may also lead us to question Pedersen's interpretation.

The weights from Kaupang with secure contexts provide a limited stratigraphical basis for metrological studies. It is also not possible to exclude the possibility that their weights – although they seem well preserved – have been changed, since the conditions for the preservation of metals in the surviving layers are not optimal. Despite these few criticisms, however, it is equally impossible to exclude the possibility that an economy based on hacksilver might have been introduced in Kaupang already at a very early date when the plots are showing evidence of permanent occupation (Pilø 2007d:195–200). The situation with the finds from Kaupang may reflect the resilient but flexible tradition of lead weights.

One final possibility is that fragmented silver could be involved in transactions at sites like Kaupang even before the introduction of the normalized weights. The very early use of hacksilver is documented at other urban settlements. In Birka the first appearance of hacksilver can be identified in the earliest layers from the 8th century (Gustin 1998:76, tab. 1). The crucial question is whether the hacksilver in those contexts can reasonably be interpreted as a form of currency or as raw material for the silversmith. Based on the assumption that silver, in the original *aurar*-economy, was handled and valued in the form of whole objects, this second possibility appears a more reasonable alternative. However, hacksilver may have been used, for instance, to weigh and complete the weight of ingots in a transaction between two traders. Without more thorough metrological studies that take this question as their starting point, this is difficult to determine as things currently stand.

When, over a longer or shorter period, hacksilver developed into an accepted medium of value in Kaupang, the boundaries between the embodied *manifest* and the body-less *amorphous* silver would have become much less clear. It was at sites such as Kaupang that people began to conjoin reckoning by *aurar* and reckoning by the originally Islamic mitqāl, which in Scandinavia was apparently reformulated as reckoning by *þveiti* and ertogs. Mental dexterity was needed to make the differentiation in exchange relations with these two quite different principles of value possible. I believe that this can be demonstrated with the set of lead weights from Jåtten. The use of hacksilver in the North Sea region seems, in the 9th century, to have continued to be the exception rather than the rule. It was only sites such as Kaupang that seem to have practised this use of hacksilver. And it was in peculiar situations such as, for example, the Viking camp at Torksey, that this method of valuing and payment was accepted at such an early date within the North Sea zone. The finds from Kaupang may show that an economy based upon *aurar* and a hacksilver economy could co-exist. Here there may have been *mental elbow-room* between those who may have wanted to use either whole objects or fragments as currency. What makes Kaupang stand out, as it then stood at the northern limit of the Danish-influenced area of Southern Scandinavia, was that hacksilver was apparently used in exchanges of an economic character as early as the first half of the 9th century. The practice of weighing and valuing fragmented silver may have been difficult to accept beyond the limits of the settlement, at least in its earliest phase.

Paradoxically, the introduction of a hacksilver economy may, in the longer term, have contributed to the undermining of Kaupang's position as a central place for trade and exchange in silver in Viken. A system of market exchange and a regime of value that was based upon reckoning and thinking in terms of *aurar* was itself a precondition for the exceptional status of the site in relation to its hinterland. But the practice of fragmentation changed the distribution of silver in the longer term, reaching a wider tranche of the population. The normalized weights embodied a different regime of value and an alternative view of what constituted economic value, at least during their period of introduction. The valuing of silver as a substance in this phase was no longer essentially bound to *aurar*-objects. This perspective may give us an insight into why hoards containing fragmented dirham silver do not appear in Southern Scandinavia during the 9th century but rather are limited to the Baltic Sea area. It was the "*aurar*-sites" of Southern Scandinavia, such as Kaupang, Uppåkra and Tissø, that "sucked up" the Oriental silver coin in the initial phase and re-cast it as standardized *aurar*-objects (Kilger, this vol. Ch. 7.9). When the influx of Samanid coin from the East broke into the circulation of silver in Southern Scandinavia during the second quarter of the 10th century, the influence of the "*aurar*-sites" diminished seriously (Kilger, this vol.

Ch. 7.7). This may have coincided with a more habitual use of the larger spheroid weights beyond Kaupang, using which one could deal with hacksilver in much greater quantities. In this phase we see the first hacksilver hoards in the hinterland of Kaupang, and the use of hacksilver was established as an accepted form of currency beyond the limits of the trading site.

Conclusions

In this section, I have taken a closer look at the connexion between the fragmentation of silver objects and the introduction of normalized weights. Steuer's dualistic model of *Gewichts-* and *Münzgeldwirtschaft* has given us a good image of the appearance of the new, Oriental, silver economy at the end of the 9th century and its establishment in Scandinavian society in the 10th and 11th centuries. At the same time, though, Steuer's polarized conception contrasting the use of coinage, on the one hand, and an economy based upon weighted and fragmented silver on the other, leaves a blind zone with regard to the economic practice previously to be found in Scandinavia, namely reckoning in *aurar*. Alongside the coin- and weight-economies in Scandinavia one could put a third means of valuing and making payment, the ring-/ingot-economy. The coin-economy and ring-/ingot-economy are related to each other, since the associations of value were embodied in whole objects. It was primarily the ring-/ingot-economy that was confronted by the weight-economy in Scandinavia at the end of the 9th century. Rings and ingots were the principal objects of value that were used outside of the monetized areas of Western Europe. During the Viking Period a ring-zone stretched from Ireland in the West to Russia in the East. In theory it was only whole objects that could be used in various forms of transaction under the ring-/ingot-economy. Under the weight-economy, by contrast, silver was valued by a quite different principle. In this case fragmented and amorphous silver could also be used in transactions.

With the introduction of the normalized weight-types came a new way of reckoning – i.e. of weighing silver in both larger and smaller portions. However it was not just a different economic order, in accordance with which people started to weigh silver using precise weighing equipment, that characterized the Orientally inspired weight-economy, but rather a concurrent change in attitude: a preparedness to dissolve the wholeness of the silver object. There was a nagging uncertainty, yet paradoxically also a liberation from the influence of the sacred *aurar*-objects in various social and economic situations, that came in with the use of hacksilver. As Anton Brøgger was able to show long ago, the øre was dealt with in two different ways in Scandinavia right up to the High Middle Ages: both following the earlier øre-standard and the later ertog-based øre-standard. The earlier øre, which was originally based upon Merovingian gold coinage and its reckoning, was used to calculate whole objects such as rings during the Viking Period, and later on in the Middle Ages also coins. A clear example is Harald Hardrule's coin-reckoning of the mid-11th century in which the earlier øre-weight was apparently applied (Skaare 1976:79). Using the later øre, people apparently dealt with and calculated larger quantities of hacksilver. It was the spheroid weights, which may have been known as "ertogs" in the Viking Period, that were the fundamental and legitimating element of the hacksilver economy from the beginning of the 10th century onwards. When the spheroid weights fell out of use over much of Scandinavia, the significance of hacksilver as a counterpart of value in exchange relations also vanished. As a type of weight the ertog began to be taken out of use at the end of the 11th century (Steuer 1997:327–30).[59] However the ertog survived as a unit of reckoning, and was integrated as the smallest module weight into the weight-systems in use in the Scandinavian kingdoms of the 12th and 13th centuries.

Several authors have described hacksilver as small change that facilitated trade (e.g. Suchodolski 1977; Hårdh 1996:24–5). However the introduction of hacksilver as a counterpart of value was presumably no intrinsically self-evident economic process. A number of preconditions had to be met for payment with pieces of silver to be able to claim an autonomous and recognized place in the sphere of exchange. The recognition of hacksilver not only required items of equipment such as the normalized weights; in its initial phase it was also restricted to specific sites. It was the early urban sites of the Baltic Sea region that were the nodes of the growing and ever-increasingly regular long-distance trade of the Early Viking Period (Sindbæk 2005) which may have developed and put into practice the conventions of payment that were based upon fragmented silver. This is the practice that we can probably then trace in the North Sea region in the 9th century at sites such as Kaupang. The inception of the use of hacksilver as a counterpart of value in the sphere of exchange outside of the trading sites may very likely have provoked conflicts in Viking-period society, since fundamental concepts of what constituted value were called into question. This "new" convention respecting payment may, to certain groups, have appeared alien and irrational.

Both Steuer's (1987, 1997) and Gustin's (2004c) studies present the introduction of the weight-economy at the end of the 9th century as a peaceful and innovative process. This economic system is described as a convention for making payments that created trust and which was established amongst those groups that were engaged in long-distance trade and who dealt with large quantities of silver. The employment of the normalized weights for economic purposes, however, was not necessarily an immediately conflict-settling and confidence-raising innovation, as the works of both of those scholars might lead one to believe. As anthropological studies of recent years have argued, especially the work of Annette Weiner, the motivation behind economically directed exchanges is not necessarily based upon the principle of reciprocity – i.e. a principle that always aims at a mutual balance in economic relations (see above, p. 262). Economy is rather a matter of monopolizing value: of defining what is valuable and so exercising influence. The use of hacksilver as a counterpart of value may then have ushered in new constellations within society and in respect of political power in the transitional phase.

New groupings appeared in Viking-period society at the end of the 9th and beginning of the 10th centuries which could perhaps be linked to payment using hacksilver and so indentified themselves with the alternative approach to valuation. A series of archaeological complexes indicate that in certain cases the normalized weights can be associated in their phase of establishment with a male-dominated sphere: with weaponry and warfare. An example of this is the use of cubo-octahedral weights at the metal-detector site of Torksey, England (Blackburn 2002). The earliest hacksilver hoards of Western Europe around the Irish Sea and in England, such as Croydon and Cuerdale, or in the Netherlands, such as Westerklief, may be linked principally with the activities of Danish Vikings (Graham-Campbell 1992b:110–14; Higham 1992; Richards 2000:31; Besteman 2002). It is possible that these groups of fighting men, campaigning in Western Europe, were amongst the first in Southern Scandinavia to accept the system of value that went with the normalized weight-sets. The grave finds around Kaupang can be included in this case. Two burials at Nordre Kaupang which contained both balances and normalized weights were rich male graves. It is possible that the individuals who were buried in the northern cemetery were primarily associated with the chieftain's seat at Skiringssal and less so with Kaupang itself (Pedersen 2001:28). In this context, the rich male burial from Rolfsøy in Østfold should also be noted,[60] a grave that contained a complete set of eight spheroid weights, one cuboctaderal and three conical lead weights (Pedersen 2000: appendices 4 and 5, V 5). The picture that these archaeological complexes present is not, however, an entirely simple one, and could be interpreted in various ways. Alongside the military element which may be hinted at in the Southern Scandinavian context there is also an undeniably peaceful aspect to the use of cubo-octahedral weights. There were individuals engaged in long-distance trade in the Baltic Sea region who identified themselves with the use of the normalized weights (Gustin 2004c:203–34). This is exemplified in the cemeteries at Birka, in which the normalized weights reveal a different symbolic language and were used as a conspicuous feature in women's, men's and even children's graves (Kyhlberg 1980b:203, 1986:150–1, tab. 17.2). These may have been groups whose domiciles were linked to the urban trading site and who wished to mark their identity as merchants in their funerary practice (Welinder 1999:132–5).

From the Southern Scandinavian perspective, the use of hacksilver as a form of currency which first began to spread beyond urban settlements like Kaupang in the 10th century can be interpreted as a break with the ideological and economic power that was represented at the old *aurar*-sites. It was at sites such as Kaupang that aurar-objects were made and sanctioned as objects of value. It was also there that hacksilver was first used as a medium of exchange. The early hacksilver hoards of Southern Scandinavia and the British Isles may represent not only the introduction of the spheroid weights and thus of fragmentation as a practice beyond these centres, but above all show that silver had generally become available to a wider group of people outside the towns. The demise of Kaupang during the second quarter of the 10th century – which could have been for various reasons (see discussion Skre 2007j:468–9) – thus coincides with a decentralization of the handling of silver in the Viken area.

8.6 Summary

This chapter has considered how silver was used and valued as a form of currency at Kaupang. The basic problem tackled in this essay is that of approaching the concept of "money" in light of three different principles of value and payment that dominated exchange relations in Scandinavia and Western Europe during the Viking Period. These were, firstly, the use of coinage by monetized societies; secondly, the use of *aurar*-objects such as rings and ingots of standard weights; and thirdly, the use of hacksilver by non-monetized societies. Using the story of Ohthere, the much-travelled chieftain from Northern Norway, who visited Kaupang in Skiringssal late in the 9th century, as a frame, I have tried to illustrate the complicated knowledge of ways of making payments and value-norms, which those who participated in the long-distance trade of the Viking Period had to have. Those travellers who followed the "northern way"

59 This is shown, for instance, by the stratigraphical evidence from the town of Schleswig. In some areas, for instance in the Baltic states, the use of spheroid weights may have continued into the 12th century (Steuer 1997:328). The latest hacksilver hoards were deposited at the beginning of the 12th century in the Elbe-Slavic area of Vorpommern (Kilger 2000:140 and 157–8).

60 C4188–4197.

could in all probability distinguish these three methods of using and valuing silver.

It was at Kaupang in Skiringssal that Ohthere encountered merchants and craftsmen from both the North Sea region and the lands around the Baltic. The most recent excavations have provided evidence that individuals from the Frankish Empire came to the site (Gaut, in prep.; Wamers, in prep.). Pieces of Slavonic cooking pots show that merchants or craftsmen from the Slavonic area may have resided in Kaupang (Pilø, in prep.). The maintenance of regular contacts with Birka, one of the largest urban settlements in the Baltic zone, is indicated by the burial practice in the cemeteries at Kaupang (Stylegar 2007: 99–101), by casting workshops employing similar processes of manufacture (Pedersen, in prep.), and finally by the dirham finds (Kilger, this vol. Ch. 7.7). There were also influences from the Hiberno-Scandinavian settlement areas in Ireland and Scotland in the form of the distinctive lead weights with metal appliqués (Pedersen, this vol. Ch. 6.5.5). At Kaupang in Skiringssal, interaction between these groups was intensified in the densely populated settlement of the town. Here, I believe, was all that was needed for the development of a quite unique situation. Different moral preconceptions in respect of relations of exchange, with regard to what was appropriate or unacceptable, needed to be clearly explained; different views about what was a reasonable and just price had to be channelled; and conventions and rituals that established trust had to be defined and re-affirmed. It was in an urban context of this kind that exchange could cross over cultural, economic, religious and social boundaries. It was this disorderly and multifaceted urban culture that defined Kaupang as an enclave and differentiated the site from its hinterland.

A counterpart to the spatial density that characterized Kaupang as a town may be found in the character of silver as a medium of payment, value and reckoning. During the Viking Period, silver was dealt with and valued in various forms, including coins, ingots, rings or hacksilver. In specific bodily forms, the regimes of value were focused and materialized. It was in the silver body that ideas and concepts of value could find a place and be transmitted. I propose that the crucial objects of value in the Viking Period – coins on the one hand and the rings on the other – were regarded in the economic thought-world of the age as living things of the highest order. One of the fundamental problems to address in this study has been to reach an understanding of how conventions for making payments could develop and be diffused within non-state societies lacking any strong central authority. My theoretical premiss has been that ideas of standard were embodied, or in other words materialized, in objects that served as a form of currency. These objects bore associations that were considered to be of value by those who used them. Here I make use of the anthropological concept of *inalienable possessions* in order to show that economic relations must always be related to a durable and transcendental point of reference. This point of reference may be materialized in holy objects which can never themselves be the object of exchange; they rather initiate exchange. It is this point of reference, this principle or power, which animates the valuables that are included within economic transactions in a given society and provides them with the authenticity they need. One example of an inalienable possession in Scandinavia in the Iron Age is the gold ring, which belonged to the gods but which simultaneously legitimated the use of silver as currency in the form of rings and ingots of standard weights. *Inalienable principles* likewise sanctioned the use of coin in monetized societies. Forms of currency always referred to an aspect of value that was considered by the users to be unobtainable, yet which was something that people always desired to achieve. As I have also argued, these associations of value were not universal but rather differed from society to society. The second theoretical premiss of this discussion is based upon the belief that ideas of a standard could only emerge and be manifested in human consciousness if the currency was calculable according to a scale that was considered to be trustworthy. Thus these objects of value had the same characteristics that "money" has. It has been from this perspective that I have tried to comprehend the use of "money" at Kaupang.

In the section "Monetary Concepts around the North Sea", I have looked at coins as objects of reckoning and value in the Late Roman, Merovingian and Carolingian empires from the 4th century to the 9th. The coin-section itself forms the foundation in this chapter for going on to analyse the øre in a methodical manner, which I attempt to trace in archaeological evidence. Here, too, I discuss the underlying mental acceptance that was implicit in the monetization of the Carolingian realm. This section thus creates a framework explaining why the use of coin failed to gain a foothold at Kaupang. The point of reference in the system of payment using coin constituted what is called "coin-reckoning". Coin-reckoning was based upon grains, which served as an absolute point of reference. It was particularly in the reckoning by gold coins – the practice of the Late Roman Empire and subsequently in the Merovingian realm – that the weight and purity of coins were measured by use of a certain number of grains. Through the symbolic power of the grain, the coin was linked to fertility and well-being. It was religious values and cosmological concepts that the coin, as an imaginary form of capital and therefore of sanctioned value, referred to above all. In the Carolingian Empire the silver denier derived its value by alluding to elemental concepts of the Christian faith, namely salvation and the daily bread. However the denier also derived its monetary power through the lord, in his character as Christ's representative on Earth, endowing the coin with spiritual life. Similar mechanisms of value were probably also involved in the earliest Scandinavian coinage, at Ribe and Hedeby in the 9th century. The Ribe coins alluded to the cult of Odin and to Odin's battle with the forces of chaos. Odin guaranteed the order of the universe and thus the survival of the world. It was this myth that the Danish ruler alluded to and so rooted the value of the coins in a non-Christian cosmology. Because the coin was connected to an important immaterial aspect of the human conceptual world, they became valuable in the eyes of those who used them. In this section I have also discussed the function of the silver denier as a central measure of value in Carolingian society. In its capacity as a generally accepted standard, the denier could lend legitimacy to a system of commodity-money. Under a commodity-money system one did not necessarily have to use coin itself for making payments; rather, it was possible to reckon in other media such as grain, livestock, honey or wine. The conclusion drawn at the end of this section is that coinage never came to be used in Kaupang despite the close connexions with the Frankish realm in the 9th century. Presumably the immaterial facet of the value of coins was not accepted because it referred to a set of Christian concepts. At Kaupang there was also no royal power or politico-religious authority that could animate coins with a monetary value.

In the section "Traces of the *eyrir* standard at Kaupang", I have attempted to trace a monetary standard that came to be used in Kaupang. I find a materialization of this standard in the large corpus of rings and ingots in the Viking-period hoards of Scandinavia. Just like coins, rings and ingots were standardized by weight. This standard, I believe, corresponded to reckoning in øre or *aurar,* of which we have evidence in written sources such as law-codes and runic inscriptions. In the same way as coins, *aurar*-objects united the principle of countability with immaterial associations of value. *Aurar*-objects became calculable as they contained a given number of coins per øre and thus were of constant weight. This was the convention that was expressed in the formula "penningar ger eyri" which is quoted already in the early medieval Scandinavian law-codes. The building blocks of the *aurar* are "pennies" of very consistent weight such as the Merovingian gold coins of the 7th century, which may indeed have been the source of the term *aurar.* Merovingian gold tremisses were used as calibration prototypes for the fine-adjustment of weights that were used to weigh precious metal in perfectly equal portions. Silver coins such as sceattas from the end of the 7th century and Anglo-Saxon pennies from the 9th century may also have functioned as calibration models in the production of *aurar*-weights. These coins respected the same weight-standard as the Merovingian tremisses. Gold rings and subsequently silver rings were reckoned, from the beginning of the 7th century onwards, using an *aurar*-unit of 20 pennies. There is also some evidence of a heavier *aurar*-unit based upon multiplies of 10 pennies. Those "pennies" were probably Abbasid silver dirhams struck in the Caliphate in the 8th century and at the beginning of the 9th, and used as calibration prototypes.

Reckoning in *aurar* was not a practice that arose in Scandinavia; rather it had its origins in the Merovingian realm, where gold coin was in use. There, this originally Roman practice of using a specific number of coins as a unit of reckoning, was called the *uncia*-(ounce-) standard. Evidence of the Merovigian ounce is found all around the North Sea region. The ounce was given different names around this region but in fact refers consistently to a single convention of value, namely the reckoning of 20 pennies per unit. The principle of reckoning a fixed number of coins to a unit was apparently also practised in Eastern Europe. Here it appears that 10 dirhams were used per unit in the production of larger objects of standardized weight such as rings. This practice was probably the origin of the Eastern *grivna*-standard. "*Grivna*" means "ring" but is a unit of weight at the same time. Evidence of both the Western ounce-/*aurar*-system and the Eastern *grivna*-system is found at Kaupang. In Scandinavia, the concept of *aurar* may have been linked to the myth of Odin's eternal gold ring Draupnir. This mythical ring produced eights rings of equal weight every ninth night. In such a way, I suggest, the ring was associated with the ideas of predictability and justice, and with fertility at the same time. The myth of Draupnir probably made use of the canonical relationship in reckoning between the mark and the øre as weights that is recorded in documentary sources.

I have linked the introduction of the *aurar*-standard in Scandinavia to the growth of North Sea trade in the 7th and 8th ceturies. Large quantities of coin were in circulation within this network, on both sides of the English Channel. In Scandinavia, however, although there may have been contacts with this trading network, coins apparently were not accepted as currency but rather were melted down to make larger and carefully weighed *aurar*-objects such as ingots and rings. This practice of melting down may explain why gold coins from Western Europe are so rare in Scandinavia after the Migration Period. They appear only in very unusual hoards such as the Viking-period gold hoard at Hoen. One possibility is that the system of reckoning in *aurar* first established a foothold at production and exchange sites in 7th-century Scandinavia. As a possible "*aurar*-site" I discussed the Lundeborg/Gudme complex on Fyn, in Denmark. A good sign of an *aurar*-site is evidence of metalworking, casting, and the presence of weights, particularly of lead. Lead weights like those found in craft contexts may have been used by the smith to weigh precious metal in exact portions in the process of producing *aurar*-objects such as gold rings in the Norwegian Merovingian Period and silver rings in the Viking Period. Kaupang can be regarded as a Viking-period *aurar*-site, with clear evidence of casting. Dealing with silver in accordance with the *aurar*-standard provides us with yet one more basis upon which to understand why coins are so rare in the earlier phases at Kaupang and indeed generally all over Scandinavia throughout the 9th century. The distribution and handling of silver in the various superregional exchange network was done through larger, re-cast units such as ingots. The melting down of coined metal to make larger *aurar*-objects was the central custom in the handling of metal in Southern Scandinavia in the Early Viking Period; perhaps in the preceding Merovingian Period too. This custom is, in my opinion, also the key to the explanation of the absence of coin in hoards all over the area down to the beginning of the 10th century when hacksilver hoards start to appear.

Finally, I argue for the presence of a commodity-money system in Kaupang. There is written evidence for the existence of a fully developed commodity-money system based upon øre in Scandinavia only from the 12th century. However the archaeological evidence in the form of finds of weights, ingots and rings respecting the øre-standard indicates that such a system may have been in existence as early as the Late Iron Age. If the silver denier was the point of reference for relations in terms of value and price in the Frankish realm, this role was taken by the øre in Scandinavia. In the same way as, conceivably, people thought and calculated by the denier-unit, people in Kaupang thought and reckoned in terms of both metal *aurar*-objects that were materialized in silver and of other, non-metallic media such as, inter alia, textiles of a certain length and breadth.

The øre may have been employed as an immaterial unit of both reckoning and value because it was thus possible to compare and measure the value of different goods. The øre-standard may thus have laid the foundations in Kaupang for the use of money and for quasi-market trade separate from any socially binding sphere. The Kaupang/Skiringssal central-place complex can, consequently, be regarded as an economically closed space in relation to its hinterland. This space was an entity within an interwoven economic complex. In the workshops in Kaupang metal *aurar*-objects were manufactured which were used as currency. At the *thing* the reckoning in *aurar* was annually defined and legitimated. And in the town itself, goods of varying quantity and quality could be bought and sold using *aurar*/øre as the standard of reckoning.

The third and last conventional practice for making payment that shaped the economic relations in Kaupang is considered in the section "Ertogs, *þveiti* and fragments". In this section I discuss the use of hacksilver as a form of currency which involved a rupture with the principles of valuation that were represented both in coins and in *aurar*-objects. Yet even in the use of hacksilver there is, paradoxically enough, an objectification of standard. How, though, could that standard be maintained when the silver that was being used was shattered into tiny fragments? The answer lies, in my opinion, in the use of the normalized weights that began to spread around the Baltic Sea region during the second half of the 9th century. The principle of calculability resides in the standardization by weight of the normalized weights. The idea of value is symbolized and materialized in their uniform and very distinctive appearance. The small cubo-octahedral weights and the large oblate spheroid weights follow the weight-standards that were employed in the Caliphate. Methods of payment in the Caliphate depended, on the whole, upon the weighing of coined metals such as gold and silver. Reckoning was done by the unit of the mitqāl, and to a lesser extent in numbers of coins. The same practice of weighing and valuing silver by the mitqāl was established in Northern and Eastern Europe when and through the fact that people began to use the normalized weights. As I use the term, I believe that the mitqāl-standard was *materialized* in these weights. The decisive difference from the monetary system of the Caliphate was the preparedness to split up, in other words to destroy, whole silver objects such as coins and pieces of jewellery and so to change them into fragments. The fragmentation of coined silver was only exceptionally accepted in the Caliphate, where it was a controversial issue. Under a hacksilver economy the essential associations of value were no longer found in the silver objects themselves but rather were transferred to a substitute object such as the normalized weights.

Here, then, we see steps taken towards a different abstraction of value from that implicit in coins and *aurar*-objects. The weight and value of the silver could only be determined by means of the normalized weights. It was also through the fragmentation of silver that the weights received a name of their own. By the 10th century, this process of substitution in the silver economies of Scandinavia resulted, I believe, in the establishment of the ertog-standard. I make the case that it was the oblate spheroid weights that were originally called "ertogs". An etymological explanation of this term can be connected to the highly distinctive copper-alloy shell on the weights, and perhaps also the process of coating by which the outer copper-alloy shell was added to the iron kernel. Both spheroid and cubo-octahedral weights were probably calibrated according to a unit of reckoning of 60 grains which also was the basic unit of the Islamic *mitqāl*-standard. This standard unit of 60 grains, which may have been known as *þveiti* in Old Norse, was probably also used to calibrate lead weights. An etymological interpretation of that term shows that what was referred to was the very fact of splitting; specifically the fragmentation of silver objects. The introduction of the normalized weights to Scandinavia involved a new way of measuring value, which later seems to have embraced the use of lead weights such as those at urban trading sites like Kaupang too. In fact, the majority of the lead weights found at Kaupang seem to have been calibrated according to the þveiti/ertog-standard.

The employment of the normalized weights led to a process of the dissolution of conventional ways of making payments and of concepts of value that the earlier *aurar*-system had been based upon. The faith in the intrinsic value of *aurar*-objects had been rooted in their indivisibility and therefore their wholeness. However the fragmentation of silver objects involved a direct attack upon this principle; it "took apart" the body of the *aurar*-object and thus dissolved the associations of value that were physically embodied within it. The original system of valuation of the Viking Period that was rooted in the whole and simultaneously holy objects was thus challenged. A readiness to break objects up probably led to social tensions. In the course of the 10th century the new ideology of value appears in the growth of the hacksilver tradition in every part of Scandinavia.

According to my historical model, the hacksilver hoards initially represent a situation of disorder, in which the wholeness of silver was of little significance. In the early period of fragmentation new groups, who were prepared to adopt the new principle of valuation which resided in the use of the normalized weights, came to the fore. The fragmentation of silver and of *aurar*-objects can also be identified earliest amongst marginal groups such as the Scandinavian warriors who were raiding in Western Europe towards the end of the 9th century. Over a longer period, however, the use of the normalized weights also led to the use of silver being diffused across a much wider section of the population. Paradoxically, fragmentation led to the loosening of the religious hold that *aurar*-objects had over economic relations. It was probably part of this process that Kaupang's monopoly of value in its character as an *aurar*-site was undermined and the site lost its importance as the dominant trading site in Viken.

In my survey of the three principles of value and valuation in this chapter, in the form of coin, *aurar*-objects, and normalized weights plus hacksilver, I have been arguing that the use of "money" in some form or other was not alien to Iron-age societies. The use of "money" is not restricted to commercialized and market-adapted systems alone. Calculation and pricing are not limited to the modern market economy; they appear in all societies which engage in organized economic relations crossing political, social, ethnic and mental boundaries. "Money" is always ambivalent: it is moral and amoral at the same time; it bears inalienable qualities but is at one and the same time alienable. To put it another way, "money" both questions and simultaneously confirms the concept of value current in a society, because the value and acceptance of money is always linked directly to this idea of value. As a result, it is impossible, in my view, to differentiate between the social and economic functions of money. This artificial division of money has been a prominent interpretative view in scholarship on the Iron Age in Scandinavia in the 1980s and 1990s. As I see things, economic relations in modern, primitive and prehistoric societies alike remain difficult to understand if they are analysed from the outset on the basis of an opposition between anonymous and social – i.e. personal – structures. The use of "money", in contrast, is also a matter of relations of power: namely of the right to make material and so to define value.

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Post-substantivist Towns and Trade AD 600–1000

9

DAGFINN SKRE

As a basis for the discussion in the next chapter of trade and the economy at specialized sites of craft and trade in Scandinavia, a range of theoretical and empirical aspects are discussed in this chapter. This discussion takes as its starting point Richard Hodges's book of 1982, *Dark Age Economics*. It comes to the conclusion that Hodges over-estimated the roles of the aristocracy and of long-distance trade in the economic development of Scandinavia in the period AD 600–1000. At the same time, he under-estimated the dynamic power of the economy itself, along with the significance of other social groups such as craftsmen, farmers and the local elite in economic expansion and urbanization. The specialized sites of craft and trade in Scandinavia were more firmly integrated into the economy and society of their rural hinterlands than Hodges's model allows for.

Several of these problems can be attributed to Hodges's own theoretical starting point, which was rooted in Karl Polanyi and George Dalton's substantivism, and in the ideas of neo-evolutionists such as Elman Service and Carol Smith. A different approach is outlined as an alternative here, called "post-substantivism", one which enables us to consider the economies of pre-industrial societies as a special dynamic field. In the case of North-Western European societies prior to c. AD 700, it would appear that the scope for economic agency was limited within the dense social networks constricted by social norms and traditionally fixed prices for goods. The loose social networks created by long-distance trade in the 8th century provided some groups with the opportunity to exercise economic agency in both production and trade.

On the basis of these discussions, an alternative is also developed to Hodges's typology of the specialized sites of craft and trade in Scandinavia. While, prior to c. AD 700, seasonal markets were linked only to aristocratic central places such as Helgö and Gudme, early in the 8th century the first local market sites independent of the central places emerged on a seasonal basis. About the same time two seasonal markets with a significant element of long-distance trade were established, Ribe and Åhus. Around 800 the fourth type of specialized site for craft and trade, the permanently settled town, appeared.

Finally, two central issues in Hodges's model are discussed: the importance of long-distance trade, and the connexion between trade and the aristocracy.

The first element in the place-name Kaupang is *kaup*, the Old Norse word for a "deal" or "trade". This word occurs in all the Scandinavian languages. The root of this word entered the Southern Germanic languages in the Roman Period from Latin, in which *caupo* means "innkeeper" or "small trader", reflected by Old High German *koufo* and Old English *cēpa* (Green 1999:224–6). With various suffixes this produced a range of words for a trading site: for instance Old Saxon *cōpunga,* Old English *cēaping* and Old Frisian *kāpinge* (Schmidt 2000:87). The introduction of the word to the Scandinavian languages, probably from Frisian or Old English, apparently took place sometime in the last couple of centuries before the Viking Period (Ljunggren 1937:101; Bjorvand and Lindeman 2000:461; Schmidt 2000:86–7). Its specific language of origin cannot be identified on purely philological grounds, although in terms of cultural history a Frisian origin seems likely (Seip 1930:8–10). Frisian trading expanded strongly in the 8th century (Verhulst 1985; Spufford 1988:32; Lebecq 1999; Verhulst 2000:113), when Scandinavians came into contact with their enterprise at the trading site of Ribe.

Allowing for some uncertainty concerning the age of the word's different forms, the diffusion of the word *caupo/koufo/cōpunga/cēaping/kāpinge/kaup* seems to follow the wave of foundation of trading sites and towns that slowly rolled across North-Western Europe in the 7th and 8th centuries, first at the mouth of the Rhine and in the South-East of England, and from the 8th century onwards in Scandinavia and along the southern shores of the Baltic. There had been trading sites in these regions before, such as Lundeborg on Fyn (c. AD 200–600; Skre 2007j:446–9), where trade using silver and gold as currencies was practised. It is probably from this time that another word concerned with trade came into the Scandinavian languages such as they are known from the Viking Period, namely *aurar* (Kilger, this vol. Ch. 8:280–1; Skre, this vol. Ch. 10:345).

The word *kaup* probably came in with the upswing in trading activity that the new trading sites and towns of the 8th and 9th centuries bear witness to. Those who visited these sites came to trade, and it is no surprise, therefore, that precisely this term came to be included in the word that was used to designate such sites. *Kaupang* means "a site where trade goes on". The composition with *-ang/-ing/-ange/-inge* etc. is found in the other languages of Scandinavia as well as in Old English, Old Saxon and others (Ljunggren 1937:123–4; Schmidt 2000:87).

Just as the people of the Viking Age, contemporary scholars have employed this emergence of trade as the basis for identifying and classifying specialized sites for craft and trade. Richard Hodges's book of 1982, *Dark Age Economics: The Origins of Towns and Trade AD 600–1000,* deserves much of the credit for the higher level of research that the Carolingian, Anglo-Saxon and Scandinavian sites have enjoyed in the last 25 years. This research has largely taken as its starting point the essential premisses and conclusions of that book. But recent years in particular have seen a number of scholars challenging Hodges's model, while new evidence from excavations has also brought into question both his premisses and conclusions. The 25th anniversary of the publication of that book may be a suitable juncture for a discussion of some of the principles the book is based upon and a number of its conclusions.

Such a discussion is presented in the present chapter. In several respects, alternatives to Hodges's ideas and terms are proposed. Elements of Hodges's model are based upon substantivist theory, and this chapter will begin by taking up these more theoretical issues, particularly the view of economy as *embedded* in Early-medieval society (9.2–3). Other key components of the model are of a more descriptive character, and the discussion of these components is consequently more empirically based (9.4–6).

This chapter begins with a summary of the main points of Hodges's model (9.1). That is followed (9.2) by a discussion, based upon a case study, of some of the substantivist terms and theories that Hodges employed. The specific case-study, the economy of Norway during the period 1000–1500, has been chosen for two reasons. First, the sources are sufficiently diverse and informative, and research into them adequately comprehensive, for it to be possible to undertake a real test of the relevance and validity of the ideas and principles of substantivist concepts. Second, the Norwegian economy in this period comprised a series of elements, not least the so-called "commodity-money system" *(varepengesystemet),* which may well have been traditional practices deriving from the period of primary interest in this book, AD 600–1000 (Naumann 1987; Skre, this vol. Ch. 10:344–7, 352; Kilger, this vol. Ch. 8:270–1, 296–7). Thus an outline of the economy of Norway from 1000 to 1500 prepares the ground for the discussion in Chapter 10.

In order to lay a theoretical foundation for sketching out the alternative to Hodges's model that is presented in Chapter 10, a separate section (9.3) is dedicated to one particular aspect of the criticism that has been directed at the substantivist approach during the last quarter-century. This concerns the critique that economists, anthropologists and sociologists have aimed at one crucial premiss of Polanyi's understanding of the economy: namely that while the economy of pre-industrial societies is entirely embedded within society, the market economy is *not* embedded within industrial society. If the modern economy is also regarded as embedded, the basis for the essential difference postulated by the substantivists between the economies of pre-industrial and industrial societies is taken away. This has massive consequences for the way in which the relationship between economy and society in pre-industrial contexts is both analysed and understood.

Armed with the conclusions and insights provided by these discussions, in the three final sections I take up three key topics within Hodges's model as they present themselves in the case of Scandinavia. First, his typology of specialized sites for trade and craft is discussed, a discussion that leads to an alternative typological scheme comprising four main types of such sites (9.4). Hodges links trade closely with the aristocracy; this view is examined in relation to the four types of sites (9.5). A central point for Hodges is also the significance of long-distance trade at specialized sites of craft and trade; this is assessed here in comparison with the significance of intra-regional trade (9.6).

In recent works, Hodges has responded to many of the empirical criticisms his book has met (e.g. Hodges 1989; 1999; 2000). Although it may seem unfair to focus critically upon a study 25 years old, the reason for following such a course is that the original book provides a good springboard for a critical discussion of the principal themes of research into this topic during the last two decades.

9.1 Substantivist emporia

Perhaps only Philip Grierson's article, *Commerce in the Dark Ages* (1959), has been more influential than Hodges's book for recent research into the trade and urbanization of North-Western Europe in the post-Roman Period. Both studies apply a substantivist perspective. Hodges's main term for the specialized sites concerned with craft and long-distance trade of this period, *emporia,* has gained wide currency. This word, which was used by contemporary analysts and authors such as Bede, means "a trading place" or "a market place". Hodges uses the term *emporium* in order to distinguish such sites from towns of the older, Roman type, which essentially fulfilled military and administrative functions (episcopal sees and secular administration), as well as from the towns that grew up from the 10th century onwards, which mostly fulfilled regional administrative and economic functions.

Inspired by Polanyi and Dalton, and by sequential evolutionary models and taxonomies developed by anthropologists such as Elman Service (1971), Carol Smith (1976) and Kenneth Hirth (1978), Hodges located the emporia in a specific socio-political context, within which they played a particular economic role. Before the period of the emporia, in what Polanyi (1963:30) called *primitive economies,* gift-giving was predominant, and any markets that did exist were, in economic terms, of marginal significance. The emporia belonged to an economy governed by the aristocracy, lacking market trade, in other words, an economy of the type that Polanyi (1968:280–1) called *archaic.* Hodges (1982:16 and 50) adopted this view, although he also introduced terminology from Hirth (1978) and Smith (1976) by calling the emporia "gateway communities" in "dendritic central-place systems", in other words, ports of entrance for long-distance trade within societies that otherwise had no market trade. This stage of development was succeeded by "solar central-place systems", which in Western Europe means towns with trading and administrative functions that appeared in the 10th–11th centuries.

However, even before the era of the emporia – in the "primitive economies" in other words – there were seasonal markets, in both Merovingian Europe and Anglo-Saxon England. As Hodges understands the sources concerning these (1982:49), for instance the market of St.-Denis outside Paris, the trading there was *peripheral* to the economic life of the society (Bohannan and Dalton 1962), in other words, one could not trade foodstuffs, labour or land at this market (Hodges 1982:15). Markets of this kind were usually held at royal courts, aristocratic residences, monasteries or the like. Gudme/Lundeborg on Fyn would be a Scandinavian counterpart (Skre 2007j:446–8).

Clearly both functionally and structurally different from these markets were the emporia, which began to emerge from the 7th century onwards, in Scandinavia from early in the 8th century at Ribe. These were nodes of the networks of long-distance trade; Hodges explains their appearance as the result partly of the expansive economy of the Carolingian Empire and partly of the strategic policies pursued by Anglo-Saxon and Scandinavian kings. Before the foundation of the earliest emporia, according to Hodges (1982:54 and 65), these kings had access to prestige goods by means of direct contact and gift-exchange with remote courts. He identifies the kings' and chieftains' need to control such exchange as the reason for abandoning that system in favour of the emporia. The growing volume of exchange made such control increasingly difficult, while prestige goods were also increasingly passing through the hands of merchants rather than of emissaries sent by the courts themselves. If the king were to lose control over trade and the goods were to fall straight into the hands of his kinsmen and allies, his socio-political role as the provider of these goods would come under threat. As a result the kings limited exchange to bounded and easily controlled sites (the emporia) in the boundary zones of their territories.

Hodges subdivides the emporia into three types (1982:50–2), which he labelled A, B and C. Emporia of Type A are markets held in border zones, often by the coast. In a "major attempt to maximise this hitherto periodic long-distance trade" (Hodges 1982:51–2), kings founded emporia of Type B, which differed from their predecessors by having "planned streets and dwellings which overlay the earlier clusters of structures" (Hodges 1982:52). The residents of emporia of Type B included both foreign traders and local craftsmen. The traders brought in goods which they sold in the emporium, and then departed with other goods that they could sell in other emporia (Hodges 1982:56–65). The craftsmen who lived in the emporia met the needs of the traders for housing, clothing and the like. Type C was a transitional category to the next stage, the solar central-place system.

The involvement of local craftsmen and the need for provisions of food from the hinterland in emporia of Type B, gradually led to the region becoming integrated into the economic life of the emporium. Hodges (1982:148–9) considered that the exchange of goods involving the craftsmen and the hinterland was not of a market character but was rather something carried out on a local basis within kin-based networks, governed regionally by institutional mechanisms. All the same, this economic integration between the emporia and their hinterlands undermined royal control of the exchange of goods with the result that the kings had to adapt to an entirely new socio-economic situation (Hodges 1982:65). A factor in this development was the fact that long-distance trade declined towards the end of the 9th century. The net result was that many emporia were abandoned while others assumed new roles, becoming emporia of Type C. These had a greater part to play in the regional economy than their predecessors, including administrative functions for the surrounding territory. In this way, Type-C emporia really belong to a new type of society, the state society. It would appear that Hodges included this final type solely in order to accommodate the development of Birka and Hedeby from the early to middle 10th century onwards.

Hodges discusses possible connexions between the various stages of his sequential model and different forms of measuring value and means of making payments. He concluded that the connexions between these two phenomena were different in Scandinavia from those in England and in the Carolingian realm. Before the early, *peripheral* markets, both areas had had particular classes of materials and objects, such as silver and gold, that were attributed with value. For this type of measure of value Hodges employed Dalton's term *primitive valuables* (Hodges 1982:107; Dalton 1977:198–9); these were used as complementary gifts, alliance-forming gifts, etc., but not as currency for trade. The next stage of development is *primitive money,* which was of much the same character as *primitive valuables,* but which could also be used as currency. Hodges wrote, with reference to Birgitta Hårdh (1978), that despite minor minting in Ribe and Hedeby from the early 8th century onwards, *primitive valuables* in the form of whole silver objects were the predominant measures of value in Scandinavia until as late as the 10th century, when hacksilver came to play the role of *primitive money* (1982:116). In the 11th century this measure of value and form of currency was superseded by the third and final mode, *early cash,* in the form of coined silver and gold, the value and use of which was controlled by a king or a bishop. In the Anglo-Saxon and Carolingian emporia, early cash was always the dominant measure of value and currency (Hodges 1982: 117).

9.2 Substantivist economics – some flaws

The application of neo-evolutionist substantivist approaches to pre-industrial North-Western Europe is weakly grounded beyond the claims of the model itself. Contrasting the approach with well-documented changes in forms of currency, trade and the economy shows that the reality was far more complex and varied than these evolutionary and sequential models allow for. These variations were in themselves far from inessential or marginal phenomena; rather they were typical and dynamic features of the economies of those societies.

Although the models are too coarse, several of the *concepts* that have been defined by substantivist economic anthropologists are nonetheless helpful in understanding both pre-state and early-state economies. It is their ordering in functional sequences and evolutionary models that runs into difficulties when the actual evidence is considered. Such difficulties can best be identified through specific, empirical analyses, one of which will be worked through below.

To substantially challenge the validity of substantivist concepts and models, the empirical basis has to be more comprehensive than is the situation with Scandinavia's specialized sites of craft and trade from the period 600–1000. A suitable case-study, however, is the economy of Norway in the period 1000–1500. This is a classic topic of Norwegian historical research, and major contributions have appeared in the past two decades. A majority of these also use some of Polanyi's terms, although at the same time they make use of a more empirical and less theoretical approach than one finds in studies of neo-evolutionist inspiration. The relatively sophisticated view of the Norwegian economy from 1000–1500 that these studies provide makes this topic a very effective one for an examination of whether the relatively general substantivist ideas and models cover the essential features of the economy.

A second reason for selecting this case-study is its close chronological, social and cultural linkage to the main subject of this chapter. The analysis below thus also functions as an introduction to the discussion of the Scandinavian emporia in the following chapter (Skre, this vol. Ch. 10). In the arguments that are made there seeking to explicate the economy of the Viking Period, it is of some help to consider the economy of the succeeding period as having emerged from that of the Viking Period. There were important changes in the transition from one period to the next, such as the consolidation of the kingdom, conversion to Christianity, and a new wave of urbanization. However certain lines of continuity can be traced.

Two sets of terms are used that are of particular significance in the wider discussion of urbanization. Absolutely central are Polanyi's three types of exchange of goods (1957:250), which he calls *forms of integration:* namely, *reciprocity, redistribution* and *exchange* (in the sense of *market exchange).* Polanyi's notion of *administered trade* is also discussed; the term means trade within *archaic economies,* where those in power establish fixed frameworks and sites, which he calls *ports of trade,* for trade between a local aristocracy and foreign traders (Polanyi 1957:262–3; 1963:30). The second set of terms is Dalton's terminology (1977:198–9) for measures of value: *primitive valuables, primitive money* and *early cash.*

9.2.1 The economy of Norway c. 1000–1500

In the 11th century a monetary system was introduced in Norway. Coins were common currency in the towns as early as the middle of that century. In the second half of the 12th century coins were also widely in use in the agrarian countryside (Gullbekk

2003; 2005). In the course of the 14th century both the Norwegian kingdom and the Norwegian coinage collapsed, and the use of coin became less common. This situation continued into the 16th century.

Throughout the period in which coins were used as currency, there were also transactions using commodities as currency (Steinnes 1936:66–73; Lunden 1972:76–9; 1978:19–27; Pettersen 2000; Gullbekk 2003; 2005; see further discussions in Skre, this vol. Ch. 10:344–7, 352). Thorough studies show that the relative values of the types of goods were highly stable across the centuries. These prices therefore were scarcely affected by supply and demand, but rather were based upon traditional exchange values for the goods (Lunden 1978: 94–5; Pettersen 2000). This stability was not the result of regulation by any authority; rather, it was a product of a strong social convention that could not be broken except at the cost of a high price in lost reputation (Norseng 2000a). That the prices of goods could remain stable in a society lacking a royal authority is shown by the stability of Icelandic prices for goods in precisely such social circumstances (Naumann 1987). At the beginning of the second millennium AD, this form of trade was, in the overall view, the most common, although it reduced in scope as the use of coinage gradually became more usual. When the supply of coin fell in the 14th century, trade using commodities as currency again became the normal form of exchange, even in the towns. As will be argued below (Skre, this vol. Ch. 10:344–6), the commodity-money system in this period was founded upon traditions derived from the Viking Period and before, when it must also have been the predominant system of payment and valuation of goods.

Market trade, with fluctuating prices, had certainly appeared from the 12th century onwards, especially in the towns and in overseas trade, albeit to a relatively limited extent (Nedkvitne 1983:347–64; Pettersen 2000:221). From the late 13th century, the kings attempted to stabilize by prescription the market prices of a range of goods, and of labour, in the towns – but not the prices of goods that were obtained from foreign trade (Nedkvitne 1983:229–30; Norseng 1983:183–8; Pettersen 2000:205; Risvaag 2006:21–3). In the code of trade laws *Bjarkøyretten,* which is known from a redaction of the mid-13th century, there are provisions that were intended to establish fixed parameters for any deal (Hagland and Sandnes 1997).

Throughout this period, it would appear that coins constituted one form of currency alongside others, such as silver, hides and cloth (Pettersen 2000:203–4). In written sources, coins are usually referred to as weighed amounts of silver, not in terms of denomination or number (Steinnes 1936:61; Lunden 1978:38): something which indicates that practically it was the silver, in other words the metal value of the coin, that determined its value in payment. Since the use of coin was more common in the towns than in rural areas throughout this period (Gullbekk 2003, 2005), it seems likely that different people traded in the towns than traded in the country, and also that, to some extent, different goods were traded in the towns.

As can be seen, the changes in currencies and styles of transaction throughout this period of some five centuries were only loosely connected; nor do they follow a chronological course of development that had a definite direction – i.e. towards a more fully developed market economy. The reason why market trade was more common in the towns was presumably because there, types of goods were on sale that did not have a place in the traditional range of priced goods, and so were in fact subject rather to pricing in terms of supply and demand. This was typical for imported luxury goods. In times of shortage, the price of fundamental subsistence goods, such as grain, could also fluctuate greatly. It was the prices of these goods that the kings sought to control.

The king's role in the economy seems to have been to establish firm parameters for trade and to suppress speculative market prices for certain goods. The king did not regulate the prices of luxury goods and he never attempted to control overseas trade, only internal trade. His objective seems to have been to look after the interests of the common people by protecting consumers against the over-pricing of necessities (Benedictow 1972:254 n.56; Nedkvitne 1983:229; Norseng 1983:183–8).

The concepts of Polanyi and Dalton noted above can be used to different degrees to characterize the various factors affecting the exchange of goods in this period. Dalton's terms can be reconciled with the types of measures of value that have just been described: commodity-money and weighed silver are *primitive money,* and the coinage is *early cash. Primitive valuables* were presumably also found in this period, but these fall outside the range of this account because this term refers to objects of value, such as gifts, that could be used in ceremonial exchange, but not to objects to be traded or used as currency for trade (Dalton 1977:198–9).

However, Dalton's terminology also has an evolutionist character, which does not fit with the account given here. There was nothing primitive, in the sense of undeveloped or simple, about the commodity-money system. It had all the key features of a monetary system, namely a fixed unit of value and defined media of payment, and it was well adapted to production and trade at the time (Skre, this vol. Ch. 10: 344–7, 352). The introduction of coinage, furthermore, represented nothing qualitatively new purely in terms of the modes of transaction, in comparison with the means of exchange that were already present.

Dalton goes on to link his concepts to specific social contexts, and these associations also fit poorly with the economy described above. Dalton wrote that primitive money was used as payment in market trade in societies where such trade constituted only a limited part of the economy. However market trade with varying prices was not the type of transaction that commodity-money was most commonly in. It was primarily used in what was the most common type of trade in this period, namely the exchange of subsistence items at prices fixed by tradition within an agrarian economy. It was also used for the payment of the tithe to the Church, for ground rent to the landlord, and more. For these reasons Dalton's terminology will not be used in the further discussion, although his criteria for distinguishing between different forms of currency are still employed.

Polanyi's term *administered trade* (1963:30) is manifestly concerned with a situation in which long-distance trade is introduced to a society that has no market economy. The administrative instruments in the form of treaties between those in power, the military protection of trade and the like, were meant to create secure fora, *ports of trade* in Polanyi's terminology, where such trade could take place. As noted, the Norwegian kings' politics specifically did *not* involve the regulation of long-distance trade or of the prices of imported goods. Polanyi's notion is therefore ill-suited to characterize the intervention of 13th- and 14th-century kings in the economy, even though some scholars have used it (e.g. Lunden 1972:67–8 and 86–9; Risvaag 2006:20–3).

Polanyi's concept of *redistribution* likewise has little real relevance to the economy of Norway c. 1000–1500. This type of exchange is supposed to be found in societies with a small market sector, if any, and with a hierarchical structure – a description that should fit Norwegian society of that period well. However it is impossible to identify clearly redistributive features in the economy of Norway at that time.

Polanyi's concept of *reciprocity* is also a poor fit. Polanyi classified gift-giving as one of the reciprocal forms of exchange in which the social function rather than the economic aspect of the exchange – the actual value of the object – was crucial. As Bourdieu points out, however, the most important difference between gift-giving and purchasing is the temporality of the transaction. While purchasing implies that provision and payment coincide in time, a suitable time has to pass between the gift-giving and the counter–gift-giving so as to maintain the social fiction that gift-giving and counter–gift-giving are "inaugural acts of generosity" (Bourdieu 1990:112). Like purchasing, gift-giving and counter–gift-giving imply a careful calculation of value, as the counter-gift has to match the gift in value in order to achieve the intended social effect. The calculation of the value of gifts might have been a challenging matter, as luxury goods were not included within the traditional scales of value unless they were of gold or silver. Thus gift-giving requires a high level of economic calculation. However it leaves little space for economic agency, and only at the risk of a high price in the form of loss of face.

According to Polanyi, reciprocity may also take the form of exchange of goods, as such swapping takes place between parties of equal social status at fixed prices. As noted, much trade in medieval Norway was conducted at fixed prices. This trade was not, however, particularly linked to transactions between persons of equal social status, although it could take place in such contexts. The Scandinavian sagas include many examples of trading at fixed prices also taking place between individuals of very different social status (Norseng 2000a). The stability of the relations of exchange thus was not a reflection of the prominent influence of power in the relationship, but rather of the fact that both parties were obliged to respect a social norm. They had to place "honour before profit", as Helgi Þorláksson has put it (1992: 242, 233).

It is noteworthy that it was not the use of commodity-money that resulted in trade being conducted according to traditionally fixed relative values. When coins came into use as currency they were adapted to the commodity-money price-system, in which they too had specific values. The introduction of coins did not in itself precipitate any breakdown of the traditional relative valuations. On the contrary, the coins were integrated into the system as one of a range of currencies, more or less on a par with the wide range of goods used as commodity-money.

The importance Polanyi has attached to the connexion between coinage and the market economy does not fit particularly well with the economy outlined above. The introduction of coinage can be associated above all with the consolidation of royal power, and less with economic change. When Norwegian minting began around the year 1000, weighed silver was a common medium of payment in both urban and rural contexts. Purely from the viewpoint of how transactions are effected, there is little difference between weighed silver and coin, as long as there is an accepted system of weights. In this light, the important change did not take place with the introduction of coinage in the 11th century but rather over the 150 years from the second quarter of the 9th century in which weighed silver became increasingly common as a form of currency, first in the towns and then in the countryside (Pedersen, this vol. Ch. 6:162; Hårdh, this vol. Ch. 5:114, 118).

As can be seen, many of Dalton and Polanyi's premisses can be applied to the economy of Norway in the period 1000–1500. But the evolutionist character of their theories, and the connexions they make between social context, methods of payment, and forms of transactions, do not fit at all well. The ahistorical and evolutionist nature of their theories gives no place for the uniqueness of every historical sequence (Gudeman 1986:29–35). These tendencies in Polanyi's works were reinforced by neo-evolutionist scholars with their explicit aim of establishing ahistorical and general models of the development of human society. Aspects of Polanyi's theory, and in particular the neo-evolutionists' development of his substantivist approach, run into the same sorts of problems faced by the adherents of classic economic theory, whom Polanyi called *formalists,* who apply contemporary economic models to pre-industrial societies. Human societies do not run according to rules of the kind that the models attempt to establish.

The analytical instruments that historical cultural disciplines have at their disposal are not of a character to reveal complex cultural and social connexions which apply universally to human society. The greatest problems are with models that associate concepts and phenomena in synchronous social constellations with diachronic sequences. As a rule, such models encounter major problems when one tries to apply them to societies other than those upon which they were formulated. The individual concepts may nonetheless be appropriate to analyses of societies in very different periods and places; their relevance, however, has to be argued for in each particular case, not taken for granted on the authority of general models. Those of us who undertake research in the historical cultural disciplines must, as a result, content ourselves with working at a specific level towards conclusions that are valid for the time and the place that is under investigation.

One further lesson is that a consciousness of the complexity of the distant past has to be reflected in scholarly terminology. It is an easy mistake to assume that societies and cultures were less complex in the period before such complexities are documented in written sources. The term *gift-economy* has, for example, been widely used in Scandinavian scholarship as a term for the economies of the 1st millennium AD. But is it right to assume that just one form of transaction was so predominant that it was characteristic of an economy as a whole? And even if one form were indeed dominant, terminology of this kind would create a misleading impression of uniformity (Moreland 2000b:32–3). There are good reasons to believe that the majority of transactions in this period were undertaken with reference to fixed relations of value, and thus according to social norms that left no space for negotiation over price. Polanyi, however, refers to gift-giving as just one of several forms of exchange that were practised according to such norms. Polanyi also warns against views that elevate one of his forms of integration into something that characterizes an economy as a whole. It is the combination of, and the interplay between, the different *forms of integration* that characterize the actual economy of a society (Polanyi 1957:250).

9.3 Post-substantivist economics

It is remarkable that, even though Polanyi declared formalist economic theory to be irrelevant to pre-industrial societies, he adopted the formalist view of the market and market trade, also for such trade as there was in pre-industrial situations. While he otherwise emphasizes the inter-connectedness of economy and society, Polanyi's idea of the market is completely anti-contextual. The market obeys only mechanical economic laws, such as that of supply and demand, and is free of influence from social relations (Polanyi 1957:256–7). Market transactions are undertaken solely with a view to economic profit. As a result, just like formalist economists, Polanyi bases his understanding of the market on one single proposition concerning humanity: "that individuals act rationally in trying to satisfy their preferences" (Hirsch et al. 1987:317, 318).

This, in reality rather metaphysical premiss has been challenged over the past few decades by anthropologists, economists and sociologists who have been exploring the territory between those three disciplines. They have shown that the assumption of human economic rationality is inadequate for understanding not only the economies of pre-industrial societies but also the economies of modern societies. As the sociologists Richard Swedberg and Mark Granovetter have written (1992:9), with reference to modern society:

> Economic action is socially situated and cannot be explained by reference to individual motives alone. It is embedded in ongoing networks of personal relationships rather than being carried out by atomized actors.

Swedberg and Granovetter thus make use of Polanyi's term *embedded* to characterize the modern market economy. The same or similar terms have been employed by a number of other scholars (e.g. Granovetter 1985; Gudeman 1986:44; Hirsch et al. 1987; Lie 1991; Davis 1992; Lie 1992:509; Swedberg and Granovetter 1992; Wilk 1996; Lie 1997:347–8; Gudeman 2001; Zafirovski 2001).

Since the notion of "embeddedness" cannot therefore be reserved for the economies of pre-industrial societies alone, as Polanyi would have it, the foundations of the sharp substantivist distinction between the market economies of industrial societies and the embedded economies of pre-industrial societies vanish. This distinction was the main plank of Polanyi's argument that the market is of no significance in pre-industrial societies, and that economic dealings in those contexts have to be understood with reference to social relations rather than economic mechanisms.

Since the market is also embedded, the sharp distinction Polanyi draws between *us,* who live in modern societies, and *them,* who lived in pre-industrial contexts, also disappears. Moreland uses Ricoeur's terms *Same* and *Other* (Moreland 2000b:2; Ricoeur 1994). Ancient socio-economic formations may then, just like contemporary ones, be understood in *both* social and economic terms. The sociologist John Lie (1997:350), using terminology adopted from Granovetter (1985:483), characterizes this approach thus:

> In avoiding the oversocialized (e.g. the substantivist school in economic anthropology) and undersocialized (e.g. the economic approach) approaches, it seeks to strike a correct balance in analyzing markets and other economic phenomena and institutions.

For Polanyi, the free determination of price on the basis of supply and demand is diagnostic of market trade. But if the market is also embedded in society, the determination of price will *never* take place completely independently of the social context, be that pre-industrial or modern. All exchanges of goods in every social situation will have an economic element, in other words, an element of the type that Polanyi finds only in the market economy. An economic way of thinking therefore cannot be associated with modern society alone, as Polanyi would have it. It could have been a factor in any period.

This does not in any way mean that the mechanisms of the market economy, such as determination of price by supply and demand, play an equally significant role in both modern and pre-modern societies. The social circumstances will always constrain the impact of mechanisms of this kind. As Swedberg and Granovetter put it (1992:10, their italics), the "level of embeddedness [of the economy] varies considerably – *both in industrial and pre-industrial societies.*"

A number of the fundamental concepts of substantivism are challenged by this view: for instance the distinction drawn by Polanyi between market trade and reciprocity. *Reciprocal* exchanges – exchanges between parties of equal status at normalized prices, which should appear within closely integrated societies (Polanyi 1957:252–3) – can be considered as trade, in Polanyi's terminology *market exchange,* embedded in, variously, kinship, tribal or neighbourly structures. This sort of trade can be seen as *both* social relationship and economic transaction. The anthropologist and substantivist Marshall Sahlins (2004:277–314) argues intensely for the absence, as a matter of principle, of the market economy in pre-industrial societies, devoting a whole chapter of his book *Stone Age Economics* to showing that the relative values of goods in such societies are fixed, and that they are only altered as a result of profound influences, such as famine. What he really demonstrates, though, is not that market mechanisms are absent; rather, he demonstrates that they are usually constrained by social norms, and that in extreme situations they supersede those norms (Swedberg and Granovetter 1992:12).

Polanyi's idea of *redistribution* can be challenged in the same manner; it may be more productive to regard transactions of this sort as trade between individuals who are at different levels within a hierarchical social structure, while the prices of goods are determined by tradition and relations of power. Polanyi's notion of *administered trade* (1963:30) is skewed and inadequate in that it directs attention to the administrative framework and away from the economic aspects of the trade in question. The economic aspects of trade in primitive societies are likewise defined out of significant existence by the term *peripheral market exchange* (Bohannan and Dalton 1962). Both the economic facets of trade and its embeddedness in social relations and norms have to be brought into the analysis in order to understand the socio-economic phenomena that these ideas attempt to describe.

If market trade is regarded as embedded, it does not become necessary to make fundamental assumptions about people's innate tendencies, in the way that the formalists do, nor to postulate absolute connexions between types of transactions and social constellations in the manner of the substantivists. Rather, it can be profitable to start from the basis that it is within the compass of human possibility to trade as *both* an economic *and* a social agent, and that the interplay between certain social and cultural conditions will give different groups and individuals *opportunities* to develop themselves within the space marked out between economic motives and social duties: as Richard Wilk expresses it (1996:146–53), between shortsighted, individual economic motives and farsighted, altruistic, social norms. Pierre Bourdieu (1990:113–16) adopts the same intellectual stance when he writes that economic agency is situated in the area between a "man of good faith" who bases all exchange on trust and generosity and "the shady dealer", who always allows "interested calculation" to govern his business.

Bourdieu, however, goes one interesting step further when he points out that "interested calculation … is never absent from the generous exchange" (1990:114–15). The real contrast to the transactions of the shady dealer is that good-faith economy is "based on a set of mechanisms tending to limit and disguise the play of (narrowly) 'economic' interests and calculation." Bourdieu thus introduces a distinction between the individual's own, private assessment and calculation of the transaction and the positions acted out in the public domain vis-à-vis the parties to the trade and others. Economic agency may thus clothe itself with hints of social agency, and so become socially accepted, and play a different social role than it otherwise would have. Bourdieu uses this distinction (1990:112–21) to create space for what he calls *symbolic capital,* a term for the social profit that is achieved by gift-giving. The main difference between "the man of good faith" and "the shady dealer" is their different emphasis on the two types of capital one can try to accumulate in transactions: symbolic and economic.

Equally of interest is the importance Bourdieu attaches to whether the parties to the transaction are members of dense or loose social networks. Intimate and long-term social relations give either party little scope for economic agency (Bourdieu 1990:115). Trade with outsiders has an element of mistrust and conflict (Gustin 2004c:166–74; Skre 2007j:450–2) which means that honour does not lie in the demonstration of a normative approach, restraint and generosity, but rather in coming out of the transaction with an advantage. In contrast to the powerfully social validation of economic agency in deeply embedded transactions within dense social networks, there may be more honour to be gained amongst one's own in deceiving a stranger by selling him poor goods at full price or by defrauding him over weight (Bourdieu 1990:115).

A number of general observations concerning the analysis of economy and society can be abstracted from the above. The connexions between society, culture, social norms and economy are so complex that absolute linkages between specific combinations of the basic conditions cannot be postulated. Each individual economic history has to be examined empirically. The market is not an ahistorical entity: markets should be regarded as "historically variable social organisations constituted by traders" (Lie 1991:227). Investigations of markets, on the one hand, have to map out their social parameters, which the substantivists prioritize and, on the other, have to explore the economic mechanisms and modus operandi. In this way, ancient markets will not appear as theoretical abstractions based upon assumptions about the profit-maximizing tendencies of humankind but rather as concrete, historical formations with real actors who exploited trading opportunities with reference to cultural norms, social relations and conflicts, structures of power, and laws. As Lie puts it (1991:230):

> Rather than assuming the invisible hand, we should investigate the concrete social relations of those who buy and sell; the visible hand of the market.

With just a few exceptions, the analytical tools that have been developed by the sociologists and economists referred to have been calibrated using analyses of the economies of modern societies with a range of evidence that is rarely available to archaeologists or historians (e.g. Gudeman 1998; 2001). Their terminology is therefore not particularly well suited to the study of prehistoric and pre-industrial societies. The one scholar, apart from Bourdieu, who has made the most extensive attempt to develop analytical instruments for such situations, is Lie, who has outlined certain social and structural parameters that allow for various grades of *opportunity* of economic agency (Lie 1992;510–15). He attaches importance to whether trade is *intra-regional* or *inter-regional,* whether it is *open* (with popular involvement in trade) or *closed* (with only certain groups having access to trade), on whether *local stratification* is high or low, and on whether *national circulation* is strong or weak. The first of these pairs of criteria is applied in the rest of this chapter and that which follows (Skre, this vol. Ch. 10).

Within economic anthropology, a number of models and concepts have been developed which are not based upon Polanyi's rejection of economic analyses of pre-industrial societies. Although the majority of these are located within the neo-evolutionist tradition, some of their concepts can still be employed outside of such a structure of thought (Brumfiel and Earle 1987; Earle 1991; Johnson and Earle 2000; Ensminger 2002).

Various terms have been used to label the direction within sociology, economics and anthropology that has been outlined here, and which has had certain impacts within archaeology too (Gustin 2004c:40–4; Sindbæk 2005:27–9). Swedberg and Granovetter's term the *new economic sociology* (1992) does not fit the archaeological context well. Lie's term *the embeddedness approach* (1997:349–51) works best in sociology and economics, as it emphasizes its contrast with the formalist approach that formerly dominated analyses of the economies of modern societies within these disciplines. Within archaeology and history, it is Polanyi's substantivism that is the point of departure, and the term *the post-substantivist approach* may therefore be appropriate.

9.4 Typologizing sites of trade and craft

9.4.1 Hodges's concept *emporium*

Is there really any strong connexion between the two principal stages in Hodges's model, the emporia of Types A and B – in other words, between seasonal market places and permanently settled urban communities? It will be shown below that this is not the case, and it is in my opinion unfortunate to group such very different types of sites together in a single category. The term *emporium* is therefore only used in the following to refer to Hodges's terminology and classification.

Emporia of Type B were derived from Type A; amongst the Scandinavian examples of this development cited by Hodges are the cases of Helgö-Birka and Südsiedlung-Hedeby. Since 1982 the view of Helgö has changed much, and there is also a good case to be made that there was no connexion between Südsiedlung and Hedeby of the kind Hodges alleges.

The comprehensive archaeological work on Helgö of 1954–1978 revealed seven building groups, four of which were excavated, one of them in its entirety. The principal period of settlement runs from the 5th century to the 10th. There were several houses here, taking the form of a series of longhouses, together with two halls and a series of buildings that have been identified as workshops for craftsmen, with up to seventeen buildings in a single building group (Holmqvist 1980:18). The buildings are of the same basic types as are also found at rural settlements in this region, although their quantity and the artefactual finds distinguish Helgö from nearly all other sites. Spectacular finds of imported objects and precious metals showed this to be a special site (Holmqvist 1980:10–68; Zachrisson 2004; Ljungkvist 2006:59–65). While the area was being excavated, this special character was inferred to be the result of trade, and therefore Helgö was identified as a predecessor of the nearby site of Birka (e.g. Herteig 1975; Holmqvist 1980).

In 1980 Helgö was still a unique site within Scandinavia (Holmqvist 1980:64). In the past quarter-century, however, many similar sites have been discovered (Skre 2007d:48–50). Their common features include a central, aristocratic residence, and some have a plurality of houses and varying levels of evidence of trade and craftwork. There is also evidence that they served as assembly places for people from a large territory, accommodating cult activities, *thing*-moots and the like. Rather than emporia, or specialized sites for trade and craft at which long-distance trade was the key activity, these should be understood as aristocratic residences with diverse central-place functions, including seasonal trade and craft-production (see below p. 337–8). The trade at these sites was for the most part regional, with a minor proportion of long-distance trade goods (see the analysis of Borg in Sindbæk 2005:87–98). Although Helgö does also have a few spectacular imported objects, it fits this general picture well. It manifestly does not fit into Hodges's definition of Type-A emporia.

That Südsiedlung was long believed to have been a predecessor of Hedeby is due to two factors. First, it is located on the southern edge of the town and had already been there for about half a century when the town was founded. Second, there appears to have been large-scale production of textiles and other materials at the site (Steuer 1974:154–65). On the strength of dendrochronological dating evidence, a massive wharf-structure, implying large-scale sea-borne trade, has been associated with the 8th-century pre-Hedeby phase of settlement here (Crumlin-Pedersen et al. 1997:68). Typical of this wharf-structure, however, is the fact that none of the timbers had any sapwood, so they cannot be used to date the wharves themselves dendrochronologically other than as *termini post quos* (Schultze 2005:361). In the case of the dating of the sunken huts, there is no definite evidence to place any large number of them in the period before Hedeby itself was founded. The 8th-century phase of Südsiedlung therefore looks like that of a normal rural settlement. The large number of sunken huts more probably belong to the period after Hedeby had been established. In that light, Südsiedlung appears as one of many similar settlements that have been discovered in the vicinity of Hedeby in the last 20 years, such as Schuby (Kühn 1987), Gammelby (Willroth 1987), Kosel-West (Meier 1994), Kosel-Ost (Meier 1998b), Winning (Meier 1998a) and Füsing (Dobat 2004). These have been examined to different degrees, and are not all contemporary, but all belong either entirely or partly within the Hedeby period. All, too, have the same sort of evidence of specialized production as at Südsiedlung, probably of textiles in most cases (Müller-Wille et al. 2002:15–29).These were rural settlements, of which a few were established before the urban settlement at Hedeby. After the town had come into being these settlements concentrated upon the processing of raw materials that they could produce themselves to market in Hedeby. There is nothing to indicate that the 8th-century phase at Südsiedlung matches Hodges's definition of an emporium of Type A, nor indeed that Hedeby should be regarded as having evolved from Südsiedlung.

Based upon what is now known about Scandinavian market sites, there would appear to be only one site that could accommodate the two stages in Hodges's bipartite concept of the emporium, Ribe. Throughout its existence, this site has evidence of long-distance trade and craftwork using imported raw materials. It emerged in the early 8th century and was abandoned in the mid-9th. The market site was only in seasonal use to begin with (Hodges's Type A) and came into permanent settlement in the 790s (Hodges's Type B).

Apart from Ribe, Hodges's notion of a Type-A emporium fits only one site, Åhus in Skåne: a seasonal market site that has rich evidence of long-distance trade and of craft-production using imported raw materials. This market site was abandoned at the same time as Ribe, in the mid-9th century, but it appears never to have developed into a permanent settlement as Ribe did in the 790s.

Apart from Ribe, it would appear that those Scandinavian sites that fit Hodges's definition of Type-B emporia, Birka, Kaupang and Hedeby, appeared with no preliminary stage of Type A. There are very few Scandinavian examples of emporia that fulfil Hodges's definitive criteria (2 of Type A, 4 of Type B), and in only one case, Ribe, did a Type-A emporium develop into one of Type B.

Were there other specialized sites for trade and craft in this same period or before? Hodges (1982: 149–50) discussed the possibility that there could have been "periodic fairs" apart from the emporia, at which intra-regional trade could have been undertaken. He concluded, though, that this was not the case. It was only the reforms of Charlemagne in the Carolingian realm that created such sites in the 9th century, along with real market trade within the boundaries of the Empire (Hodges 1982:63 and 148–9). Outside the boundaries of the Empire, in other words in the Anglo-Saxon kingdoms and in Scandinavia, competitive markets depended upon the specialized craft-production in the emporia. Hodges, however, stressed that this development took place only because it was promoted by the kings (1982:163): "The central role of power in the development is beyond question."

In the past quarter-century, a number of sites have been found in England that do not fit this view. As Ben Palmer (2003:48–9), and Katharina Ulmschneider and Tim Pestell (2003:1) state, these finds challenge Hodges's understanding of the socio-political context and economic role of the emporia. In Scandinavia and around the Baltic, too, there are a number of sites that conflict with this model. Most of these appeared before the year 800; the character of trade there is varied; they fit into diverse local situations; and not all of them can be associated with kings or an aristocracy. As in England, the discovery of such sites in Scandinavia and around the Baltic completely explodes Hodges's representation of trade and of specialized sites of craft and trade in Scandinavia from c. AD 600–1000. The identification of such sites is partly due to the discovery of new sites, such as Fröjel on Gotland, Sebbersund on the Limfjord in Jutland, Uppåkra in Skåne, and Tissø on Sjælland (Skre 2007j:452–8). But many of them have also been identified as a result of more detailed study and re-assessment of sites that have long been known, such as Sorte Muld on Bornholm and Löddeköpinge in Skåne. Earlier scholarship regarded the latter two, like many other sites with evidence of trade and craftwork, as significant centres of long-distance trade. However, more precise analyses of the structures and finds reveal that these were sites of markedly differing character (Sindbæk 2005).

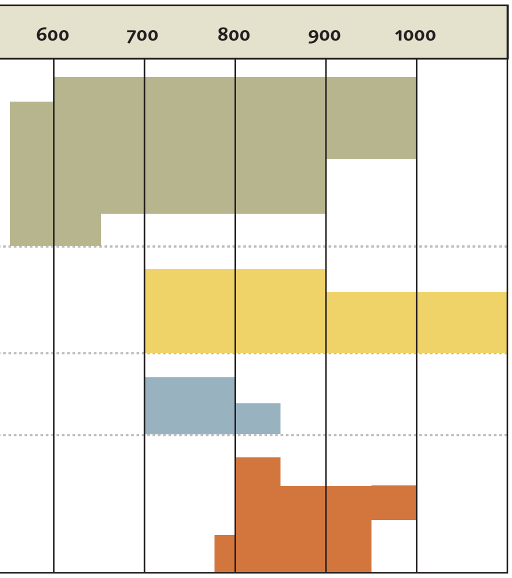
9.4.2 An alternative typology of sites

The foregoing discussion means that Hodges's two categories of emporia, Types A and B, can be kept (below, Types 3 and 4), but that the number of Scandinavian sites these terms can be applied to is restricted to just two and four, respectively. The discussion has also demonstrated that there is a need for further categories so as to be able to designate all of the various kinds of specialized sites of craft and trade. Two new categories will be described here (Types 1 and 2). The discussion has further identified three criteria that are crucial to the definition of the various types: whether the sites had *seasonal* or *permanent* activity; the trade was *intra-regional, inter-regional* or *long-distance;* and finally whether their *location in relation to political entities* (at central places; on boundaries of kingdoms) (Fig. 9.1).

The final point needs to be refined. A *region* in this regard is not delimited geographically but in economic terms. It is constituted of an area that is integrated in the economic sense: within which there is regular and frequent economic interaction. *Inter-regional* refers to trade between such regions that does not cross profound cultural and linguistic boundaries. In this case that would mean that it takes place within Scandinavia, which in a certain sense can be regarded as one cultural and linguistic zone (Fenger 1992; Hastrup 1992; Meulengracht Sørensen 1992). In the period under discussion, trade of this kind was primarily at the aristocratic level, and constituted the first step towards the economic integration of the regions. Ohthere's voyage to Skiringssal and Hedeby provides an example. *Long-distance* trade differs by crossing major cultural and linguistic boundaries, and also, usually, by by-passing regions that are not involved in this trade. The importance attached to the cultural and linguistic boundaries is related to the quite different degree of economic agency that can be enacted in loose as opposed to dense social networks (above, p. 335).

The perception of Helgö as a predecessor of Birka developed, as noted, in a period during which this site was more or less unique in the archaeological record. Nowadays Helgö can be accommodated as one of quite a large number of complex sites where there is evidence of craft-production and trade: Tissø, Uppåkra, Sorte Muld and Gamla Uppsala, for instance (Hjärthner-Holdar et al. 2002:164–9). The evidence of craft and trade at these sites is copious, but it is still only a limited part of the evidence of activity there. These were much more complex sites, and therefore the craft and trade have to be seen as just elements of a greater whole. At their hearts, these sites were aristocratic residences with political, religious and juridical functions for their surrounding territories. Their seasonal market trade was congruent with these other roles. The evidence of craft and trade at these sites has to be viewed in its full context. As a result, it is inappropriate to label them with Hodges's term *emporium,* for sites of that kind are not multifunctional but are exclusively sites for craft and trade. The actual sites in question also lack the quantities of objects of long-distance trade that Hodges's term presupposes. Multifunctional complexes of this type are quite accurately characterized by Walter Christaller's term "central place" (1966: 14–26), and I would call the activity at some of them that has left extensive evidence of craft and trade *central-place markets* (Type 1; Fig. 9.1).

	Permanence	Trade	Context	Site, Date
1. Central-place markets	Seasonal	Inter- / intraregional	Central place	Old Uppsala Tissø Uppåkra Helgö Sorte Muld Lundeborg
2. Local markets	Seasonal	Intraregional	Independent?	Löddeköpinge Sebbersund Fröjel
3. Nodal markets	Seasonal	Long distance, inter- / intraregional	Border area?	Ribe I Åhus I-II
4. Towns	Permanent	Long distance, inter- / intraregional	Border area	Ribe II Hedeby Kaupang Birka



The identification of specialized sites of craft and trade at central places requires sufficient archaeological work to have been undertaken. At most major aristocratic farmsteads there will be some evidence of specialized craft-production, and weights, coins, hacksilver and other items that can be associated with trade will be found. If there is only a small amount of finds, however, this could all be limited to production for and trade with the permanent residents of the site. To categorize them as *central-place markets,* the quantity of finds has to be so large that it can be explained only in terms of production for and trade with a visiting population (Skre 2007j:455–8).

To some extent the same sort of range of finds, but in a rather different local context, is encountered at sites that I call *local markets* (Type 2; Fig. 9.1). These are sites such as Sebbersund (Christensen and Johansen 1992), Fröjel (Carlsson 1991; 1999) and Löddeköpinge (Svanberg and Söderberg 2000). The artefactual finds at such sites constitute only a small proportion of long-distance trade goods, and the craftsmen largely made use of local raw materials (Sindbæk 2005:76–8 and 87–97). This shows that these were not nodes of the long-distance trading network but rather seasonal market sites of, essentially, intra-regional significance. This category includes everything from major market sites, like those referred to above, to the many small landing places and beach markets (Carlsson 1991; Ulriksen 1998; Dobat 2007). Like the previous category, it can be difficult to identify the boundary between these and sites with more specialized production, which might, for instance, have been undertaken at the instigation of the local ruler rather than for sale of the products to visiting traders and consumers. The absence of clear central-place features in the localities may also be due to a lack of archaeological investigation, and more detailed studies may, as a result, come to show that a few of these sites did belong to central-place complexes.

The Scandinavian sites that produce extensive evidence of trade and craft that Hodges grouped as his emporia of Types A and B thus can be divided into two additional categories using the criteria explained (Fig. 9.1). The datings of the various categories of sites show, as Callmer has already noted (1995), that prior to the year 700 trade and craft-production were linked to aristocratic farmsteads (Type 1: *central-place markets).* Here these were seasonal activities, and the locations are sites that produce evidence of other central-place functions. From the beginning of the 8th century onwards, markets of two new kinds were founded: Type 2, *local markets,* apparently independent seasonal markets of essentially intra-regional significance; and Type 3, market sites that are also connected to the long-distance trade networks and which are therefore called *nodal markets,* corresponding to emporia of Hodges's Type A. Towards the end of the 8th century and around the year 800, Type 4 was established, the permanently occupied urban settlements that I call towns (Skre 2007d:45–6; 2007b:452–5), corresponding to emporia of Hodges's Type B.

9.5 Kings and trade

Central-place markets were clearly situated at aristocratic centres, while towns were located at the boundaries of the kingdoms that royal powers were establishing in this period (Skre 2007j:458–63). With both categories of sites, then, a connexion with the aristocracy is clear, even if in different forms, as the central-place markets belong with socio-political structures with their roots in the Roman Iron Age while the towns were founded by the royal power that grew from the 8th century onwards; in any event by a very high-status aristocracy, which in some cases, in

Figure 9.1 *Using the criteria of permanency, range of trade, and local context, Scandinavian and Baltic sites with extensive evidence of trade and craft-production can be divided into four types. The datings show the periods of the trading and productive activity, not the entire functioning lives of the sites. The sites listed under Types 1 and 2 are representative examples, but Types 3 and 4 show all the known examples of these types.*

England and on the Continent, was ecclesiastical (Verhulst 2000:112).

The socio-political position of local and nodal markets, however, is less clear. Given that all other sites with substantial evidence of long-distance trade were linked to the royal power, one would assume that nodal markets also had such connexions. In its early phase as a nodal market, Ribe appears to have been associated with royal authority (Näsman 2000:56; Skre 2007j:458). Ribe is situated in a liminal region between the Danes and the Frisians, and thus has the same kind of boundary location as the four Scandinavian towns and the Anglo-Saxon towns of the same period. In the case of Åhus, the situation is more difficult, as the political entities of the 8th century and their possible boundaries are quite obscure – apart from the fact that there was a king of the Danes called Angantyr in the early 8th century. This name is also recorded in the Danish royal dynasty of the 9th century, which might indicate that the same dynasty had also been ruling in the 8th (Andersen 1985:21–2). This, however, is extremely uncertain, and so too is the matter of what territory these kings ruled at various dates. In light of the later extent of the kingdom, it is possible that Åhus lay on the eastern border of the Danish king's territory, on a border with the various peoples of the Baltic zone. But this is no more than a possibility.

As far as the knowledge of the archaeology of their hinterlands goes, neither Ribe nor Åhus was part of a central-place complex, even though Näsman (2000:59) suggests a connexion with the centre at Vä some kilometres inland in the latter case. The large number of greater or lesser local markets that grew up in the 8th century similarly do not appear to form part of any clear, local, socio-political system. Of course they must have played a role in some sort of socio-political structures, but those were most probably horizontal networks of co-operative relations rather than hierarchical structures in which dominance and dependency were the critical binding elements.

Turning the attention beyond the Scandinavian homelands, the Slavonic market sites along the southern and eastern shores of the Baltic, with greater or lesser Scandinavian elements in their ranges of finds, such as Groß Strömkendorf (Reric), Ralswiek, Wolin, Elbląg (Truso) and Staraja Ladoga, can also be classified as nodal markets for long-distance trade between the Scandinavian and Slavonic areas.

Kings, then, founded towns and nodal markets. What does this imply about their relationship with the economy, and especially about their scope and motives to control it? Hodges regarded all trade in this period as being administered by the aristocracy, and so considered the establishment and development of sites of Types 3 and 4 to be the outcomes of political decisions. Hodges thus expressed a very strong belief in the ability of kings to control both the economy and society.

There is clear evidence that kings played a part in establishing and moving markets and towns. The classic Scandinavian example is King Godfred's plundering of Reric and relocation of the *negotiatores* there to *Sliesthorp*, an operation that can be counted as the foundation of Hedeby (Rau 1955:78–81; Schultze 2005; Skre 2007j:458–9). The foundation of towns of this kind, even if rather less dramatically, is widely attested over the next three centuries. It is also clear that kings played a major role in the establishment of a secure legal basis for trade, both as legislators and as the guardians of peace. The establishment of standards for weights and coinage was also the kings' duty. The royal administration of rights and responsibilities in the towns is well documented, as, with reference to 9th-century Birka, in *Vita Anskarii*. The exaction of taxes and tolls was probably a feature of Viking-period Scandinavian towns just as it was in their contemporary and earlier Anglo-Saxon and Carolingian counterparts (Ulmschneider and Pestell 2003:6–7).

Kings could thus make provision for, stimulate, or create opportunities for economic agency within the population. The kings could likewise control the organization of production in and trade from their own properties, and perhaps influence, to a degree, the same concerning the remainder of the aristocracy. But it is a big step from this situation to the assumption that kings could generally *control and direct* economic agency within the population, namely in production, trade and consumption, as Hodges presupposes. The scope for royal control that Hodges implies was not to be found in the Scandinavian kingdoms in the 11th and 12th centuries. The kings of that period thus had much less power than Hodges postulates for the kings of the period three or four centuries earlier.

There is really no reason to believe that the kings' capacity to control and direct the economy had fallen over time. A general perspective suggests that production and trade grow out of natural conditions, social relationships, cultural norms and an economic agency – all of which lay well beyond the range of control of the earliest kings. Hodges's assessment of the ability of kings to control and direct the economy has no empirical support, but is rather based upon his substantivist view that economic agency played no autonomous social role. Consequently he opts to assign the dynamic to the political sphere.

9.6 The significance of long-distance trade

For Hodges, *long-distance trade in luxury goods* was the key to understanding towns and nodal markets, which he called emporia. According to him, these were founded by kings in order to attract traders who could supply those kings with attractive goods from distant lands. However the large body of archaeological evidence from these sites right across Northern Europe shows that luxury items constituted only a very limited proportion of what was imported. The great majority of imports were essential goods, such as quernstones, whetstones, cooking vessels, and raw materials for craftsmen, together with rather ordinary jewellery for the use of the non-aristocratic sector of society.

The paucity of exclusive and exotic goods such as expensive weaponry, drinking vessels, furs, clothing and jewellery from stratified deposits cannot properly be interpreted as evidence that such were not traded in the towns and nodal markets. Items such as these would not have been casually lost, but rather kept with care. Indeed, exclusive imported goods did find their way into the richly furnished graves from this period that can be found over much of Scandinavia. Is there, however, any reason to postulate that such goods would, as a rule, have entered the region via towns and nodal markets? Some of these sites have cemeteries, and in some of those there are graves with rich, imported grave goods (Blindheim et al. 1999; Arbman 1940–1943). Many of those objects were probably unloaded from ships in the harbour close by. However the majority of graves with expensive foreign objects, such as the silks in the Oseberg and Ladby burials, were located away from towns or nodal markets. Based on what is known of sea travel in the Viking Period, there is little reason to suppose that such items were bought in the closest towns, which in those cases were Kaupang and Hedeby. The frequency of Viking-period voyages to England, Ireland, the Carolingian realm, the Baltic, and down the Russian rivers, should indicate that the aristocracy had a much wider range of ways to obtain attractive goods than just sitting and awaiting the arrival of Frisian or Slavonic trading vessels in the harbours of Kaupang or Hedeby.

It is the unconsidered use of the term *gateway community* that has led Hodges astray here. He derives this term from Hirth (1978), who constructed a general model of the early importation of long-distance goods on the basis of empirical evidence from Mexico c. 1200-500 BC. However one of the essential conditions of this model disappears when transferred by Hodges to Viking-period Scandinavia. Hirth (1978: 37) wrote that gateway communities are found in circumstances in which "transportation is difficult or underdeveloped". This is hardly the case with the Viking Period in Scandinavia, when both the greater and the lesser aristocracy had ships that could take them to sites from which exclusive and exotic goods could be obtained, either by way of plunder or through trade.

The establishment of nodes for long-distance trade, thus, can hardly have had enormous impact on the availability of exclusive and exotic goods for the highest aristocracy. They had their own connexions and channels many centuries before the Viking Period. On the occasion of his visit around the year 890, Ohthere called King Alfred his *hlaford,* meaning "lord" (Bately 2007:44); apparently a well-established relationship that could also have been exploited to allow one to dispose of one's own goods and obtain new ones, as both gifts and objects of trade.

Contrary to Hodges's view, therefore, it would appear that the towns were not especially crucial for the supply of attractive, imported goods to the elite. It appears more likely that long-distance trade increased the scope for the lower aristocracy and the ordinary farmers to obtain goods. Men such as Ohthere bought and sold goods in these places, and the crews of these men's ships would presumably have taken advantage of the opportunity too. Consequently a high proportion of the goods that were offered for sale in towns and nodal markets were probably within the means of a wide spectrum of the population. The widespread occurrence of the humbler sorts of imported goods and craft-products in Scandinavian Viking-period graves shows, furthermore, that access to those items was quite common (Solberg 2003:223). The goods that came to towns and nodal markets through long-distance trade went on to reach both the local aristocracy and the populations of the average agrarian settlements (Bäck 1997; Müller-Wille et al. 2002), who probably visited those sites or achieved the goods through trade within the regional economic networks.

Another social group that gained access to the new goods by way of long-distance trade consisted of particular sets of craftsmen (Gaut, in prep.; Pedersen, in prep.; Wiker, in prep.). In the towns and nodal markets there is evidence of production using imported raw materials such as glass, lead and bronze.

There is little if any evidence of such production at other types of sites (Sindbæk 2005:97). From such raw materials, metalcasters certainly also produced exclusive artefacts that had only a few, well-off customers. There is nothing, however, to indicate that the productive work of the Scandinavian glass-bead makers was in the least bit exclusive. This was rather a form of mass production of quite simple items. The same image emerges concerning the majority of the metalcasters' output, judging from the remains left behind by them. Their production was primarily targeted at the average population, not just the aristocracy, nor even at the merchants at the sites, as Hodges imagined.

Since 1982, Hodges (2000:83) has taken account of the huge amount of archaeological evidence of craft-production of goods in towns and nodal markets. In light of this he has adjusted his model, and proposed that it was not long-distance trade so much as this specialized craft-activity that towns and nodal markets were established in order to both control and ensure. It is not, though, the degree of specialization that distinguishes the products of craft in towns and nodal markets from those that were produced at local markets and central-place markets. It is instead the types of raw materials that some of the craftsmen were using. In towns and nodal markets and at these other sites alike, there is evidence of craft-production involving bone, antler, iron and other local raw materials. However, as noted, evidence of craftwork making use of imported raw materials such as glass, lead and bronze is virtually only found in towns and nodal markets. This is presumably due to the fact that it was here that such raw materials could be obtained; hardly because these craftsmen had a particular need of protection as assumed by Hodges. That evidence of these craftsmen is found at these few sites must also have something to do with the permanent character of the towns and the good marketing conditions which allowed the craftsmen to settle there on a more or less permanent basis.

Dealing with Silver: Economic Agency in South-Western Scandinavia AD 600–1000

10

DAGFINN SKRE

In the present chapter, points and conclusions arising from discussions in chapter 9 will be applied to the results from the other chapters in this volume with a view to identifying the dynamic elements within the economic expansion during the Viking Period in South-Western Scandinavia.

Prior to c. AD 700 specialized sites for trade and craft were found only in association with aristocratic central places. Here trade was conducted essentially within dense social networks, and the scope for economic agency was severely restricted by traditionally fixed prices for goods and by the loss of reputation that would have followed any exposure of economic motives in such dense relationships.

Right down to c. 825, trade in Scandinavia was conducted almost entirely as a commodity-money system, with gold weighed in *aurar* as the common measure of value, and essential goods as the media of exchange. If traders from afar were not offered payment in goods they were interested in, they would have demanded payment in silver, which had been the preferred currency since the end of the 7th century in the Carolingian and Anglo-Saxon lands. This is probably the functional background to the minting of sceattas at Ribe, apparently the only Scandinavian 8th-century site where silver was used as currency.

When the three towns of Ribe, Hedeby and Kaupang were founded around AD 800, each had a permanent population that depended upon selling what it produced for its survival. This, together with the increased level of long-distance trade that these towns made possible, expanded the scope for economic agency. Although goods were still the most important form of currency, silver in the form of Western coins was probably a usable currency from the start at Hedeby and Kaupang, while local sceattas were the usable currency at Ribe. Around 825 coins were struck at Hedeby and Ribe, and around the same time hacksilver came into use as currency in Kaupang. Both of these were probably elements of an integrated policy of the King of the Danes to create normalized currencies in his kingdom. A special type of payment-ring, the Duesminde, can be linked to this initiative, which probably also included an active policy of melting down Islamic, Carolingian and Anglo-Saxon coins.

When the Danish kingdom started to fall apart in the 850s, this policy could no longer be maintained, and fragmented Islamic coins gradually became common in South-Western Scandinavia, as they had long been around the Baltic. This coincided with a powerful economic recession in the Anglo-Saxon and Carolingian economies and trade, with the result that Ribe was abandoned while Hedeby and Kaupang survived on trade with the Baltic and Western Scandinavia. The stronger integration of Hedeby and Kaupang into the Baltic trading network may help to explain why a new, common weight-standard was adopted in these areas in the 860s and 870s, manifested in the cubo-octahedral weights.

In the 10th century, silver became a common form of currency beyond the towns as well. However, throughout the period under discussion here, payment in goods must have remained the most common payment method in both the towns and most rural areas. The most fundamental transformative role played by the towns regarding the Scandinavian economies had little to do with forms of currency. Their deepest significance in the development of the Scandinavian economies lay in the opportunity that the loose social networks, created by long-distance trade and the urban way of life, provided for the emergence of economic agency.

The great expansion of trade and economic life throughout the Viking Period cannot be explained without allowing for a significant degree of economic agency amongst landowners, craftsmen (Callmer 2002), agrarian producers, and indeed also amongst groups who were involved more or less in purely trading itself – the buying and selling of goods they themselves had not produced. In this chapter an attempt will be made to identify the social groups who participated in production and trade, and to investigate what scope the historical situation in the period AD 600–1000 gave these groups to exercise economic agency.

In the first section of the present chapter (10.1), this set of questions will be analysed with reference to each of the four types of sites defined in Chapter 9. The procedure will be to show what opportunities for economic agency various social groups had, and to link this to the historical situation they had to operate within, especially to changes in forms of currency. In the second section of the chapter (10.2) another essential aspect of the economic expansion is treated: the production of agricultural surplus and of long-distance trade goods.

10.1 Silver and sites AD 600–1000

10.1.1 Central-place markets before AD 700

How were various forms of trade put into practice at this early date, and what scope for economic agency was there? As Callmer would interpret the finds from Southern Sweden (1995:65–6), craftsmen in this area prior to c. AD 700 were essentially involved in producing one-off items, presumably, therefore, to specifications given directly by their customers. Craftsmen were primarily situated within regions, within the parameters of dense social networks. Production largely took place where the customer lived, although there was also production at central-place markets (Hjärthner-Holdar et al. 2000:164–9).

Since production was done to order, both the production and trading of the products of craft would have taken place within a relationship between the producer and the customer. This relationship must at least have lasted from the first contact concerning what was to be made, through the stages of specification and the sequence of manufacture, on to delivery and payment. The duration of this relationship indicates that a relationship of trust was established which probably involved some element of power. Close and durable social relations left the two parties little scope for economic agency (Bourdieu 1990:115; Skre, this vol. Ch. 9:335).

The same would be the case for all trade in essential items that took place within local communities, independent of market sites, and between people who knew one another or were connected by indirect social ties. As is well documented for later periods, prices in trade of this kind were strongly controlled by traditional valuations, and transactions were primarily exchanges in kind (Sawyer 1990). Traditionally determined prices for goods like this are known through scattered and diverse sources from the end of the Viking Period through to the 16th century (Steinnes 1936; Lunden 1972; Naumann 1987). The system of goods prices in these sources demonstrates that one or maybe a few goods, evidently goods that were consistently needed and which were produced to a consistent quality, had an additional function – they became the common measure of value for the other goods (Skre, this vol. Ch. 9:331).

Money has three functions. It can serve as *currency,* as a *measure of value,* and as a *means of saving*. In modern societies these functions are commonly unified in just one form, coinage, but in earlier times they were most commonly divided amongst various media. In the period 1000–1500 goods were commonly used as currency in Scandinavia. As a *measure of value,* on the other hand, silver was the norm. Relative values amongst a large number of different kinds of goods were much more easily kept track of when they were defined according to a common measure. In transactions, silver could serve as the common measure used to value the goods involved, although no silver was exchanged. The weight of silver was given in *øre* or *marks* of silver (Lunden 1978:20–7; Naumann 1987:376–7). In some regions in Norway the value of a productive and healthy cow, called the *kyrlag,* was also an important unit. Icelandic sources show that the most important export from the island, wool, fulfilled the role as a measure of value there (Naumann 1987:379–80).

As a measure of value and a currency, silver is first found in Scandinavia at the beginning of the 8th century, with the striking of sceattas at Ribe. This does not, however, seem to have led to silver gaining such a role beyond Ribe. Silver must have taken on the role of a measure of value in the rest of Scandinavia in the period between the second quarter of the 9th century, when it was first used as a *currency* in the towns, and the mid–late 10th century, when numerous hoards show that silver was then commonly found even in rural areas as a *means of saving* (Pedersen, this vol. Ch. 6:162; Hårdh, this vol. Ch. 5:98–9; see below, pp. 347–52).

Two elements allow the media of payment of the Late Viking Period to be characterized as integral parts of a *commodity-money system,* distinguishing the trade from barter involving a limited use of silver. The first of these is the existence of one dominant *measure of value,* silver, in which the prices of goods were expressed. The second is the fact that the most common form of *currency* was goods rather than the medium in which value was measured, namely silver. Can these features be traced to the beginning of the Viking Period, or even earlier?

As Christoph Kilger shows (this vol. Ch. 8:270–1), silver was the usual measure of value in the Frankish realm at the end of the 7th century, when it superseded gold, which had served that purpose since the Roman Period. The same switch from gold to silver as the measure of value took place in the Anglo-Saxon kingdoms at the same time (Spufford 1988:19– 22). In Scandinavia too, the common measure of value before the silver age must have been gold, which was weighed in units of the early *øre:* a term that etymologically is derived from the Latin word for gold, *aurum.* The existence of weight-standards and gold objects adjusted by weight from the 3rd century to the 6th shows that gold was then valued according to weight (Brøgger 1921; Steinnes 1936; Bakka 1978; Herschend 1980; Munksgaard 1980; Skre 2007j:448– 50).

Both the weight-standards and the terminology of weight thus point towards gold having served a function as a measure of value in this period. Could it, however, also have served as a currency in trade? The existence of large weight-adjusted rings indicates that gold was exchanged in quantities of a specific value. But the rings are rather heavy, perhaps indicating that they were used in the payment of fines, dowries, tributes and other transactions involving large sums fixed by tradition. Had gold been used for payment in trade, there would normally have been a need for a variety of values large and small, varying according to the quality and quantity of the goods. One would then expect the gold objects to have been cut up in order to serve as payment for goods of varying values.

A few finds of fragmented gold and weight-adjusted objects from contexts of payment show that gold, and to a lesser degree silver, could indeed serve as a currency in trade between the 3rd and 6th century. In particular, the finding of 25 purses with 200 gold coins, gold fragments, etc., in the major weapon deposit at Illerup Ådal in Jutland shows that it was not uncommon to carry gold as a currency as early as the beginning of the 3rd century AD (Ilkjær 2000:40 and 122). From this century and the three following centuries more than 70 *solidi* and a large number of fragments of gold have been found on Helgö in Mälaren (Holmqvist 1980:22; Kyhlberg 1986a; Oddy and Meyer 1986), and there are similar finds of coins and fragmented gold from the trading site of Lundeborg on Fyn (Thomsen 1993:77–80). Some of the finds from these two central-place markets might have been goldsmiths' raw material, but finds of gold together with weights and touchstones show that some of it must indeed have been for payment. The nine Danish hoards of hacksilver and gold from the 5th and 6th centuries, the two largest of which contained 4.5 kg silver (from Høstentorp, Sjælland: Voss 1955) and 4.5 kg of gold (from Broholm, Fyn: Kilger, this vol. Ch. 8:293, Fig. 8.14) have been interpreted by some scholars (e.g. Runge 2007; Kilger, this vol. Ch. 8:298) as goldsmiths' caches of raw material. However both the composition of the hoards (Voss 1955: 213–17; Munksgaard 1956:64–6) and the clear concentration at the only major market site of this period, Lundeborg (Runge 2007:7), indicate rather that at least some of these finds have to be regarded as currency hoards. Frands Herschend's analysis of hoards of fragmented and whole gold objects from the 3rd to the 5th century on Öland concluded that the gold was acquired in Central Europe as payment for the agricultural surplus production, most probably of wool (Herschend 1980:230–49).

Altogether, these finds provide reason to conclude that fragmented gold was used to a certain, albeit a rather limited, degree as currency in trade from the 3rd century to the 6th. The relatively rich finds of cut gold at central-place markets such as Helgö and Lundeborg show that such currency was in use at sites of this kind.

The sort of long-distance trade that Herschend (1980) detected on Öland could hardly have been undertaken by free traders on specialized sites for craft and trade. It was probably put into effect amongst aristocratic families who already had established links amongst themselves. Such exchanges of specialized essential products could have been made both within Scandinavia and through Continental contacts. In the archaeological evidence, however, they can only occasionally be distinguished from gift-exchanges, as in the special case of the gold hoards of Öland. It is possible that this form of trade also made use of cut gold and silver as currency.

As has been noted, one characteristic of the commodity-money system is that there is a well-developed system of measuring values in a medium that is itself used as currency only to a limited extent. In the period c. AD 200–600, it would appear that gold fulfilled those requirements. The most important economic function of gold was probably, then, as a common measure of value within a commodity-money system, and the goods themselves must have been by far the most important form of currency in this period. Finds of gold diminish drastically towards the end of the 6th century, and from the 7th century few if any gold finds are known that could suggest that this metal was still in use as a measure of value or a currency. However the weight-unit and the terminology of *aurar* from the preceding period survived into the following centuries, implying that gold did continue to be a measure of value.

The trade at the only specialized sites of craft and trade of this period, the central-place markets, was quite probably practised as outlined here: using goods, sometimes gold itself, as the currency for transactions according to prices fixed by tradition within dense social networks that limited the scope for economic agency. Beyond that, however, those meetings between the leading aristocrats of the region provided numerous opportunities to exchange gifts, something that was also done on a series of other social occasions, such as when one visited friends on journeys, or made marriage proposals, and the like.

10.1.2 Local and nodal markets in the 8th century

The earliest extension to the use of silver as currency in Scandinavia is represented by the first striking of coins, which happened shortly after the foundation of nodal markets. A few years after the market site at Ribe was founded around the year 710, large numbers of sceattas were struck for use there (Metcalf 1984; Feveile 2006a:31; 2006b). This introduction of a new form of currency cannot be explained solely from a Scandinavian perspective, but as part of a monetization of trade between the towns and market sites which had grown up along the Carolingian and Anglo-Saxon North Sea coasts (Metcalf 2007:1–2).

For trade in Ribe to be of interest to those who engaged in this long-distance trade, the local consumers of their goods had to be able to pay in a currency that they were interested in receiving. The fact that silver came into use as a currency so swiftly after the foundation of Ribe may indicate that those who brought long-distance trade goods to the site were not directly attracted by payment in the goods that the customers in Ribe had to offer. Payment in silver was easy to accept because silver could be used in the other areas to which the long-distance traders came. This has to be why the local authority, the king, minted silver in the form that was in general use within this trading network, the sceatt. The preference of the long-distance traders for silver may also be connected to the fact that they did not just transport goods between two places where they knew the preferences of their potential trading partners. Rather, they were likely to take their money on to a number of other long-distance trading sites around the North Sea coasts where there were many trading partners with different and relatively unpredictable preferences. Silver was accepted everywhere, and therefore was to be preferred in payment. At such sites, the coin was melted down and converted into the local currency.

The scope for economic agency at nodal markets must have been greater than that within earlier trading and gift-exchange, which were undertaken for the most part in the context of well-established relationships where the social sanctions against breaches of traditional valuations put one's honour in jeopardy (Bourdieu 1990:114–15; Þorláksson 1992). Two aspects of long-distance trade changed this situation drastically. Firstly, foreign items whose value could not be defined by tradition were brought in. Secondly, the trading partners lacked social ties beyond those fleeting connexions implicit in the trading itself. The absence of social ties stripped the transaction of the social pretence which otherwise disguised its economic character, so that this character was all the more bare to the eye than it was in any essentially intra-regional transaction within aristocratic networks, or any inter-regional transaction within the regions of Scandinavia. Trade with outsiders, in loose rather than dense social networks, was not subject to sanctions of this kind. Rather, those to whom each trading partner was closest, saw the outwitting of a stranger in trading as a laudable achievement (Skre, this vol. Ch. 9:335).

This opportunity for economic agency emerged primarily in the context of transactions between Scandinavians and foreign traders, probably mostly Frisians. However, the public revelation of the economic character of these transactions would have had consequences for the other forms of trade and production that took place at nodal markets. This is most evident in the change from the production of one-off items to the mass production of various kinds of goods. This must have been the economic practice which those involved in trade internalized as a result of long-distance trade, thus making it possible to free the production and marketing of the local craftsmen's goods from the dependency on the customer involved in the sequence of order, production and delivery that had hitherto reigned. At the nodal markets of the 8th century, Ribe and Åhus, the first evidence of the mass production of identical items and the standardization of specific types is found. This was a style of production in which the consumer, rather than specifying a personal order and then awaiting manufacture before the final transaction could take place, was faced with finished goods which he or she was invited to buy. This change is evident earliest and most clearly in the production of glass beads and copper-alloy jewellery (Callmer 1995: 53–7; Feveile and Jensen 2000:17 and 22), both of them examples of production for which the craftsman had to deal with long-distance traders in order to obtain his raw materials. The link is probably that these craftsmen carried – to their own production for and marketing to Scandinavian customers who came to the market site – the economic agency they themselves enacted when obtaining raw materials from long-distance traders. In this way, one can suggest that these craftsmen literally embodied the change in economic mentality that took place at the nodal markets. They must have been at the very core of the transmission of greater economic agency into the wide variety of transactions that took place in a nodal market.

This development in economic agency thus could have had little direct connexion with the type of currency that was used at the site. Both the necessity of bringing silver into use as a currency and the greater scope for economic agency arose because the new type of long-distance trade relationships differed structurally from trade within dense social networks;

each phenomenon, however, was linked to separate aspects of the long-distance trade relations. The connexion between the new form of currency and the greater scope for economic agency was, consequently, not so strong that it would be inconceivable for one to have come about without the other. Such, indeed, must have been the case at Åhus, where silver seems not to have come into use as currency but where standardized production was to be found just as at Ribe. This difference between Åhus and Ribe must be due to the fact that the recipients of long-distance trade goods at Åhus were able to make payment in kind with goods that the suppliers were prepared to accept.

In the Anglo-Saxon kingdoms, the distribution of sceattas beyond the towns was limited, although their presence at various classes of trading sites and ordinary villages (Blackburn 2003; Metcalf 2007) is still so extensive that coins must have played a major role as currency for transactions even at intra-regional markets as early as the 8th century. In Scandinavia sceattas are found in very small quantities outside Ribe, essentially in high-status contexts (Metcalf 2007:7). This suggests that it was members of high social classes, alongside the craftsmen who were importing raw materials, who traded directly with foreign merchants. The rest of the trade at the market site, which must mainly have been amongst Scandinavians, such as the sale of one's surplus production and the purchase of artisans' products, was probably almost entirely conducted using goods, not silver, as currency. Otherwise, sceattas would presumably have had a much wider distribution.

The trade that was going on at the local and central-place markets in Scandinavia during the 8th century must also, essentially, have been conducted using goods as currency, which would presumably then have been valued according to the traditionally accepted scales. On the other hand, there was a certain, wide-ranging standardization of the products of craftwork, such as combs (Callmer 1995:65–6), indicating that craftsmen generally discovered opportunities for economic agency, and that the production and marketing of their products grew less dependent upon social relations even at the level of intra-regional production and trade. This change probably occurred because the blatant exercise of economic agency amongst craftsmen working with imported raw materials at nodal markets was adopted in other craft-environments too. These two groups of craftsmen would have been in close contact at the nodal markets. This behaviour thus became socially acceptable even within dense social networks; it was in any event less stigmatized than previously. To what extent this affected other trading going on at these sites, namely trade in various kinds of essential products within the region, is difficult to investigate.

10.1.3 Towns in the 9th and 10th centuries

The discussion now moves to the type of sites represented by Kaupang: the towns. In what follows, a South-Western Scandinavian perspective will be preserved, although the discussion will be focused more upon Kaupang and the other chapters in the present volume. This discussion is structured around the chronology of the changes in the silver currency, with a final section on commodity-money and the opportunities for economic agency in towns.

The earliest finds of silver currency from Kaupang are imported coins which must have arrived in the period AD 800–840. Few of these have been found: three Carolingian coins, one from Ribe, and two from East Anglia (Blackburn, this vol. Ch. 3:56–7; Rispling et al., this vol. Ch. 4:Nos. 6–11). As Blackburn writes (this vol. Ch. 3:56), the three Carolingian coins must have reached Kaupang after 822 but before 840. The two Anglo-Saxon coins must have arrived before 840, although it is likely that they reached Kaupang some time earlier, most probably before 825. The other silver coins from Kaupang are all Islamic dirhams which reached the site after the middle of the 9th century, probably post-860 (Kilger's Phase IVa: this vol. Ch. 7:228–35).

After around 860 there was a massive increase in the use of fragmented silver as currency at Kaupang. Silver in two forms was cut up: coins and artefacts. All the coins were Islamic, a coinage that was imported to Kaupang in great quantities throughout the second half of the 9th century until some date between either 890 and 920 (Blackburn, this vol. Ch. 3:54) or 920 and the early 930s (Kilger, this vol. Ch. 7:245). A few Islamic coins found their way to Kaupang right down to some time between 960 and 980.

Western coins c. 800–840

The only coins documented in Kaupang before around 860 were West European silver coins (Blackburn, this vol. Ch. 3:57; Kilger, this vol. Ch. 7:243–6). As Blackburn points out (this vol. Ch. 3:58), the importation of Western coins was limited to the same period at both Birka and Uppåkra. In Hedeby too, practically all of the Carolingian and Anglo-Saxon coins are from the period up to the middle of the 9th century (a total of 9 of the 137 coins from graves and urban deposits: Wiechmann 2007:37–8, figs. 3.10 and 3.11). In Ribe, however, no Carolingian or Anglo-Saxon coins have been found at all; only 203 local sceattas, 10 Scandinavian pennies, 4–7 dirhams and 3 Roman coins (Feveile 2006c). The absence of Carolingian and Anglo-Saxon coins at Ribe must be due to an efficient local melting-down policy, which must, in turn, have been based on the fact that Ribe had local coins in circulation throughout the period.

The rarest specimens amongst the six Western coins from Kaupang are the two Anglo-Saxon examples, of which only ten other specimens are known in

Norway and are extremely rare elsewhere in Scandinavia too (Blackburn, this vol. Ch. 3:56–8). In Norway, 19 Carolingian coins struck in the period 754–840 have been found, and 88 elsewhere in Scandinavia (including the Hedeby region), making 107 in all. Of the total of 125 Carolingian coins from the period down to AD 900 found in Scandinavia, therefore, only 18 are from the period 840–900 (Garipzanov 2005:tab. 1).

The latter figure is striking when one knows that from 835 to 885, and especially after 845, enormous quantities of silver coin were paid out by Carolingian and Anglo-Saxon kings and princes to Viking armies active in their areas. Some of these coins might have been put back into circulation in the same areas, since in this period the Viking armies had begun to camp over winter, and some of the troops chose to settle in those areas (Sawyer 1971:100–1). But much of this silver must have been melted down and taken back to Scandinavia (Blackburn, this vol. Ch. 3:57–8). Re-cast silver in the form of ingots and jewellery was sought after by Scandinavians who, as Kilger points out (this vol. Ch. 8:254–5), normally saw silver as valuable in the form of whole objects in the first phase of the Viking Period. Most of the 9th-century Carolingian coins found in Norway, other than at Kaupang, are complete but perforated. Thus they are regarded and treated as jewellery (Garipzanov 2005).

It is quite noteworthy, then, that the six Western coins from Kaupang had not been perforated. It is equally striking that they had not been melted down when they arrived in the town – although many others might well have been. Finally, these six coins do not appear to have been deliberately cut, while 90% of the Islamic coins that reached Kaupang somewhat later were cut. The fragmentation of unminted silver came into practice at Kaupang by the end of the period 800–840 (Pedersen, this vol. Ch. 6:162), so the absence of fragmentation of Western coins from the same period is not because that practice was unknown.

The lack of melting down, fragmentation and perforation constitutes a set of three significant and distinctive features that contrasts the handling of Western coin in Kaupang in the period 800–840 from handling in the rest of Norway, and from later handling of Islamic coin. Why was the handling different?

Down to the years around 840, the Vikings' rapacious expeditions to the West were primarily concentrated on Ireland. Expeditions to the monetized areas of Carolingian and Anglo-Saxon Europe were only sporadic. This means that coins from those areas prior to c. 840 probably reached Scandinavia by way of trade rather than plunder. Blackburn (this vol. Ch. 3:56) assumes that the two Anglo-Saxon coins came direct from their places of origin to Kaupang, and the same may be true of the three Carolingian pieces. The trade that brought them to this site might have been carried out through Scandinavians' voyages to Anglo-Saxon and Carolingian ports, or by ships from those ports arriving in Kaupang.

However, the fact that the coins remained intact after they arrived in Kaupang shows that there was some point in keeping them thus. Reworking would have stripped them of the characteristics that distinguish coin from silver; therefore, it would appear likely that they had a function as complete coins. As Wamers (in press) would interpret the finds of jewellery that had come from the Carolingian lands, people from those areas were resident in Kaupang. If, then, Kaupang was partly populated by people who were familiar with the use of this sort of coin in payment, one has to consider the possibility that the absence of reworking of the coins was because they were valid currency in the town.

Danish coins and fragmented silver c. 825–860

In the second quarter of the 9th century there was a change to the currency in Ribe, Hedeby and Kaupang alike. At Ribe and Hedeby, coins were struck around or shortly after 825, while at Kaupang finds of hacksilver and weights show that fragmented and weighed silver came into use as currency (Pedersen, this vol. Ch. 6:162; Hårdh, this vol. Ch. 5:114, 118). In all three towns coins and hacksilver remained in use as currencies throughout the remainder of their functioning lives. Minting in Hedeby and Ribe continued for some years; in the case of Ribe probably until just shortly before the town was abandoned in the middle of the 9th century (see Malmer's discussion of Mint B 'Ribe': 2007:22–3). From the end of the 9th century, minting in Hedeby was suspended, but it resumed at the beginning of the 10th century on a large scale down to c. 980, when the town suffered an economic recession. Typical of every phase of this production of coins is that the prototypes for the form of the coins and their weight were Carolingian, especially coins that had been struck in Dorestad (Metcalf 1996; Malmer 2002b, 2007; Wiechmann 2007).

The large-scale importation of Islamic silver coin to Kaupang began, as noted, around 860 (Blackburn, this vol. Ch. 3:57; Kilger, this vol. Ch. 7:243–6), and 90% of the 90 dirhams found in Kaupang are fragmented (Blackburn, this vol. Ch. 3:Tab. 3.14). Why were coins from the Caliphate treated so differently to their Western counterparts just a few years previously?

In the Caliphate too, there was a strong rule that the form of the coin had to be intact for it to be valid as currency (Kilger, this vol. Ch. 8:303). But in an unstable period for the monetary system in the Caliphate post-840, the fragmentation of coin appeared as a marginal practice. It seems likely, as Kilger writes (this vol. Ch. 8:303–4), that this practice was introduced into Eastern Scandinavia at more or less the same time, with the arrival of fragmented coins from the Caliphate. That cutting up Islamic coins became so much more widespread in Scandinavia than in the Caliphate must have been because Scandinavians, when undertaking further transactions with such coins after they had reached Scandinavia, dealt with others than the original users of the coins. The fragmentation, re-melting and perforation of Islamic coinage thus destroyed none of its qualities as a currency, although the same treatment of Western coinage would have done so. The dirhams had become *amorphous* silver, as Kilger puts it (this vol. Ch. 8:256).

However, the practice of cutting up and weighing silver had not only come to Scandinavia with fragmented dirhams from the Caliphate. As already noted (above, p. 345), fragmented gold and silver had been used in payment in Scandinavia for centuries before the Viking Period, even if probably only on a small scale and primarily at central-place markets such as Lundeborg and Helgö. The first recorded fragmentation of silver at Kaupang in the second quarter of the 9th century (Pedersen, this vol. Ch. 6:162) would seem to have been a continuation of this tradition, because it was not then coins that were fragmented but rings, ingots and the like (for a different view, see Kilger, this vol. Ch. 8:298).

Fragmented, unminted silver thus served as a currency at Kaupang for 20 to 40 years before the massive influx of Islamic coins after c. 860 (Kilger's Phase IVa: this vol. Ch. 7:228–35). It is not easy to assess the extent of this early practice. Amongst the 90 definite examples of hacksilver that can be identified from the settlement area of Kaupang, several derive from types of artefacts that could be of this early period; however all the types also occur later in the century (Hårdh, this vol. Ch. 5:115). In stratified contexts datable pre-840/850, five fragments of silver can be identified as having been cut, probably for use as currency (Hårdh, this vol. Ch. 5:114). This view is corroborated by the fact that weights first occur in contexts of this date (Pedersen, this vol. Ch. 6:162). Compared to the number of coins from the same contexts (just one), the number of pieces of hacksilver is relatively large, and therefore the use of hacksilver in this period cannot have been insignificant.

Thus payment-silver was introduced in new forms more or less simultaneously in Ribe, Hedeby and Kaupang. The most basic difference between its forms in the three towns was that the silver at Kaupang was in the form of hacksilver, while that at Hedeby and Ribe had been minted. Could there be any connexion between these phenomena in the three towns?

The geographical distribution of two specific forms of payment-silver from this period can help answer that question. Two key, early artefact-types which can be identified amongst the hacksilver from Kaupang, ingots of Weichmann's Type 1 and spiral-striated rods of Type Duesminde I, are otherwise found mostly in finds from Danish territories (Hårdh, this vol. Ch. 5:104, 111). The discovery of two cut ring-fragments in contexts predating 840/850 shows that the employment, as currency, of rings of the Duesminde type began early at Kaupang.

The weight-unit upon which these objects were based indicates that there was some connexion between the minting of coins in Ribe and Hedeby and the use of hacksilver at Kaupang. The Duesminde rings appear to observe a standard of c. 50 g. This unit can be fitted into several weight-systems, including that which most of the lead weights at Kaupang were regulated by, the Scandinavian mark-/øre-units. In this system, c. 50 g corresponds to ¼ mark or 2 øre (Hårdh, this vol. Ch. 5:111-113 and 106–7; Kilger, this vol. Ch. 8:280, 286–8; Pedersen, this vol. Ch. 6:140–4). The coins from Ribe and Hedeby weigh c. 0.74 g, corresponding to the Carolingian half-denier (the obol) of the same period, and in size match the denier exactly, at 19.5 mm (Malmer 2007: 19–20). The weight of the coins can easily be converted into those of the rings and the ingots, as 32 coins make 1 øre or half a ring. The number 32 initially appears economically impractical as it cannot be divided into the usual units of 10 or 12, but it is divisible by 8, which was a common unit in Scandinavian reckoning systems (Kilger, this vol. Ch. 8:280).

Amongst the finds from Kaupang, Hårdh (this vol. Ch. 5:108–13) has identified a total of fourteen fragments of Duesminde-type rings: three of these are punch-ornamented and eleven spiral-decorated. The differences seem simply to be attributable to the fact that these fragments are of different parts of the rings. The somewhat thicker fragment from Charlotte Blindheim's excavations has not been included in these figures as, in Hårdh's judgment (this vol. Ch. 5:111), it is from an artefact of a formally closely related type, the so-called Permian ring.

The silver ingot of 48.227 g that Hårdh has dubbed "the large Kaupang ingot" (this vol. Ch. 5:106–7) was adjusted to the same weight-standard as the rings of the Duesminde type. The remaining four complete silver ingots from Kaupang weigh 1.50, 1.88, 2.98 and 3.77 g respectively (Hårdh, this vol. Ch. 5:107), corresponding to two, two and a half, four and five Hedeby/Ribe coins of 0.74 g with remarkable accuracy. As Kilger suggests (this vol. Ch. 8:278–9), one of the functions of whole coins at Kaupang – one whole coin has been found there – could have been to calibrate weights, indeed silver ingots too. The comfortable agreement in weight between the four small ingots and the Hedeby/Ribe coins strengthens the view that the melting down of silver at Kaupang observed not only the mark/øre standard but also the Danish king's standard of coinage.

In Pedersen's graphic presentation of the 146 well-preserved weights from Kaupang (this vol. Ch.

6:Fig. 6.19), there are clusters of weights close to the means of two (1.5 g), three (2.25 g), four (3.0 g), five (3.75 g) and six coins (4.5 g). However several of these units are close to fractions of the øre, and it is therefore impossible to draw clear conclusions about whether the weights also agreed with the weight-system of the Danish king's coinage.

The obvious metrological, geographical and chronological coincidences between these two campaigns of standardization, the striking of coins in Hedeby and Ribe, and the establishment of a weight-standard for silver as currency based upon the weight of the coin (0.74 g), implies that they were elements of a single strategy. One can discern the outline of an integrated move promoted by the King of the Danes for the standardization of currencies sometime in the second quarter of the 9th century – probably around 825, on the numismatists' dating (Blackburn, this vol. Ch. 3:57). The weight-standard for payment-silver was probably established for common use in the kingdom, including Kaupang, while the coins were struck for use in the two towns that handled the majority of the trade with monetized areas around the North Sea: Hedeby and Ribe. That the hacksilver at Kaupang should be regarded as complementary to coinage in the other two towns is shown by the quite striking circumstance that no pieces of hacksilver have been found in stratified contexts at the Posthus excavations in Ribe (Pedersen, this vol. Ch. 6:164). The chronology of the use of hacksilver is difficult to follow at Hedeby because of the lack of secure, well-dated archaeological contexts there. However Steuer, Stern and Goldberg (2002:137) conclude that hacksilver did not become common in Hedeby until 880. It was massive local minting at the end of the 10th century and in the 11th century that drove the use of hacksilver out of the town (Steuer et al. 2002:140; Wiechmann 2007:42).

The establishment of the new standard for currencies was implemented in the form of minting, and it is possible that the king also enforced a weight-standard and the use of silver as currency through the production of weight-adjusted objects. The carefully manufactured rings of the Duesminde type are strictly standardized both in thickness and in ornamentation: the variation of thickness is only 0.5 mm. Since they are also very consistent in weight, they stand out as the most plausible candidate for confirming the hypothetically centralized production of payment-silver for use within the Danish kingdom, which included Kaupang.

Ingots of Wiechmann Type 1 and other artefact-types that respect the same weight-standard as the Duesminde-type rings might have been manufactured through the normal melting down of fragments of weight-adjusted ingots, rings and the like, which would have been undertaken in most metal-casting workshops at sites where people used silver in payment. The 200 or so ingot-moulds from Hedeby and their 25 counterparts from Kaupang show that such re-melting was practised on a large scale in these two towns, perhaps particularly there (Kilger, this vol. Ch. 8:298).

What might have been the cause of such a policy on the part of the King of the Danes? Around AD 825, Islamic silver was steadily becoming more common as currency in the trading sites around the Baltic coasts (Kilger's Phase III: this vol. Ch. 7:221–28). The towns of the Danish king had Carolingian areas as their most important trading partners, but the Baltic trade must have been of growing significance at Hedeby. At the same time, the lands in Norway were of sufficient political and economic importance to the kingdom that the Danish king led an army to Vestfold in 813 to defend his interests there (Rau 1955:102; see Skre 2007j:460–1).

In these circumstances, the motive of the King of the Danes in establishing this new standard might in the first place have been to mark the integrity of his kingdom and his own authority, by founding monetary and weight-systems just like the Carolingian emperor and the Anglo-Saxon kings did. Secondly, it was important to preserve the position of his kingdom as the conduit of trade between neighbouring areas to the east, south-west and north. That could be achieved by establishing a standard that was internally consistent and at the same time easily convertible to the standards of the trading partners. The answer was to choose a medium of payment, silver, that was accepted, and a weight-standard that was easily convertible to the weight-systems that were used by all of these trading partners. As noted, the weight-unit that the Duesminde rings and Hedeby/Ribe coinages were based upon was readily convertible to the øre-/mark-standard that was widespread in Norway, as well as to the standard that the Carolingian and Anglo-Saxon coinages were based upon. It is also valuable to note that the weight of the Hedeby/Ribe coin was a quarter of the dirham-weight of 2.97 g (Blackburn, this vol. Ch. 3:65), which was itself an important unit in the system of weights that was introduced to Scandinavia post-860, the cubo-octahedral weights (Pedersen, this vol. Ch. 6:132). The weights of the øre, the obol and the dirham were already well known in South-Western Scandinavia when the first Hedeby coins were struck, and it would appear probable that the weight of the coin of the King of the Danes was fixed in order that it too should be simply convertible against these three weight-systems.

An important source of silver for the Danish king's production of coins, and rings of standardized weight must have been the Islamic silver that poured into the kingdom from trade with the Baltic zone. The large-scale melting down of dirhams to strike Hedeby and Ribe coins and standardized rings would explain why the number of Islamic coins in Danish and Norwegian areas pre–c. 860 is much lower than around the Baltic (Kilger's Phase III: this vol. Ch. 7:228). Similarly, coins from Anglo-Saxon and Carolingian lands, from both trade and the huge quantities of silver the Viking armies extorted after c. 835 (Sawyer 1971:100–1), must have been re-melted. This, together with the decline of North Sea trade (below), helps to explain the almost complete absence in Scandinavia of Anglo-Saxon and Carolingian coins struck in the decades following the reign of Louis the Pious (822/3–840).

The finds of fragments of Duesminde rings on Gotland and of ingots adjusted to the same weight-standard (Hårdh, this vol. Ch. 5:111) fit this picture well, as the early hoards of Islamic coins and other silver on Gotland of Kilger's Phases II (AD 790–825) and III (825–860) show that traders from there were already playing a central role in this field of Baltic trade using silver as a form of currency, as they probably were in Hedeby too.

Islamic silver c. 860–890/930

The 90 Islamic coins found at Kaupang show that, after the middle of the 9th century, fragmented Islamic coins came into intensive use as currency in the town, continuing until some time between either 890 and 920 (Blackburn, this vol. Ch. 3:54) or 920 and the early 930s (Kilger, this vol. Ch. 7:245). More limited use then continued until some time between 960 and 980. Hacksilver from undated contexts – fragmented rings and ingots, etc. – cannot be dated as closely as the coins, but the general impression of its age suggests that hacksilver remained in use alongside the Islamic coins throughout. The majority of the fragmented artefacts are from the 9th century and the beginning of the 10th (Hårdh, this vol. Ch. 5:113–14). Divided Islamic coins and fragmented silver objects were thus in use as parallel forms of currency at Kaupang from c. 860.

Concurrently, Islamic coins were becoming more common in Hedeby, and this coinage was also brought into use at central-place markets such as Uppåkra. But it was not until the 10th century that Islamic coins became common in rural areas, where the use of this coinage ran in parallel with the development of the use of other hacksilver (Hårdh, this vol. Ch. 5:99). The towns were evidently pioneering sites for this increasing use of silver for payment: complete coins c. 800–840, fragmented artefacts from c. 825/40 onwards and fragmented coins from c. 860 onwards. What could have caused the change around 860?

Partly as a result of Viking raids, the Carolingian and Anglo-Saxon towns along the North Sea coasts were abandoned or declined steeply around the middle of the 9th century, and the kingdoms were weakened by profound political instability. This led to a virtual cessation of trade, as is clearly visible in the archaeological finds from the Scandinavian towns. At Birka, contacts with the Rhineland and the West Slav areas around the Baltic were dominant until the middle of the 9th century. Then the Western contacts evaporated, while those with the Western Slavs were maintained and contacts with Byzantium, the Caliphate and the Khazar lands became predominant (Ambrosiani 1999:241–2). At Kaupang, the formerly common Carolingian pottery practically disappears from the range of finds sometime between 850 and 900 (Pilø, in prep.). The great majority of the Carolingian metalwork from the Kaupang settlement dates to before 850, and this tendency is also very clear regarding the Anglo-Saxon finds (Wamers, in prep.). These changes must have been the key reason why there are no Western coins at Kaupang dated after 840. Ribe, the Scandinavian town most immediately linked to North Sea trade, was abandoned at this time (Feveile 2006a:41).

The collapse of North Sea trade led the two surviving towns in South-Western Scandinavia to re-orientate themselves to the Baltic trade, Hedeby even more than Kaupang. Access to Islamic silver was thus improved – but why, then, was that not melted down as often as it previously seems to have been (above, p. 350–1)? This must be due to the fact that the Danish kingdom fell apart during this period. After the death of Horik I in 854, rivalry between the various claimants to the throne began, and the kingdom was divided up between them. The Danish royal authority remained in a weakened state for nearly a century from then, until Gorm the Old rebuilt it from the 930s onwards (Krag 1995:89; Jensen 2004:282–4; Skre 2007j:467). Before the time of Gorm, Hedeby was intermittently part of the German kingdom, while it is unclear what superior political structure Kaupang might have been part of. The weakening of political authority must lie behind the long periods of suspension of minting at Hedeby after the mid-9th century.

Another consequence of the collapse of the unified lordship over South-Western Scandinavia might have been that it was no longer possible to maintain norms for the forms of payment-silver that could be used within the kingdom. The practice of melting down Islamic coins, which seems to have been an element of the policy of standardization, probably ceased as a result, and South-Western Scandinavia gradually became incorporated into the practice of using fragmented Islamic coin as currency that had developed around the Baltic in the period c. 790–860 (Kilger's Phases II–III: this vol. Ch. 7:214–28).

This assimilation to the Baltic system of currencies is shown by the fact that the new and more strictly normalized system of weights for silver that was introduced c. 860/70 in the form of cubo-octahedral weights appeared simultaneously all over Southern and Central Scandinavia as well as in the Scandinavian-influenced areas south and east of the Baltic

(Steuer et al. 2002:abb. 4; Pedersen, this vol. Ch. 6: 132). It is possible that this standard was adopted, amongst other things because virtually this entire region became integrated during this period into a single economic zone. Although it was probably easy previously to convert values between the different standards of weight and payment-silver that were found within this area, the introduction of a single, common standard made trade easier still. The overarching political structures in the region during this period are obscure, but it is difficult to conceive of this new standard having been introduced and maintained if it were not secured by some strong political authority, probably based somewhere in the Baltic area.

Economic agency and commodity-money in towns

The foundation of towns meant that craftsmen could now be permanently settled elsewhere than at aristocratic residences (Hjärthner-Holdar et al. 2002). Their production thus became more independent of the orders of the elite, and the power-relation that had probably existed between craftsmen and the lord who housed them disappeared or at least became weaker. Craftsmen in the towns would thus have been able to act with greater freedom from aristocratic dominance, although at the same time they would probably have become more dependent upon making their productivity and sales sufficient to support themselves. This would presumably have contributed to a further surge in the standardized mass production that began at the nodal markets (above, pp. 346–7). Greater independence in the marketing of their own products would probably have led to greater economic agency amongst the permanently settled craftsmen.

As the inhabitants of Kaupang did not produce their own food apart from occasional fishing and perhaps some hunting, life in the town required more transactions than the life of the food-producers on the farms of the agrarian hinterland did. The large number of transactions, many of which were probably undertaken with suppliers of raw materials and with customers with whom the craftsman had no strong social ties, would have increased awareness and display of the economic aspect of the deals. Nevertheless, the situation could hardly have been one of purely economic enterprise. Even within the town, the exercise of economic agency had to be balanced against social norms for relationships with other townsfolk, the town authorities, the suppliers of agricultural produce in the hinterland, and with customers and suppliers from further afield. The many transactions of town-life, and the activity of the residents within loose networks, must have put those conventions under pressure, and they must have changed, as a result, quite significantly during the lifetime of Kaupang.

Because of the frequency of transactions in everyday life, the town's population also had a great need for currencies that all were willing to accept, and for a common measure of value that various forms of craftwork and other goods could be priced in. Silver, in various forms, seems to have been an accepted currency throughout the lifetime of Kaupang. The first generation of Kaupang's population were familiar with silver as currency only in the form of Western coins, and the second generation adopted the use of hacksilver in the form of rings and ingots; the third generation also in the form of Islamic coins. It was initially with the third and subsequent generations that the quantity of finds reaches a level which implies that silver was a widespread form of currency within the town. Silver was probably the common measure of value in the commodity-money system at the same time as it was becoming common as a form of currency, at the earliest in the second quarter of the 9th century. Before this period it was probably gold, and the most common types of commodities such as grain and cows, that were the measures of value.

All the same, other forms of currency than silver must have been used for the majority of transactions, particularly by the first two generations but also by later generations. This must have involved the use of goods as currency. The craftsmen sold their products, but what could have been the most significant commodity they accepted in payment? As Kilger points out (this vol. Ch. 8:270), the Frankfurt Capitulary of AD 794 notes the relative values of the denier and various types of grains, indicating that grain was a common form of commodity-money. Since grain would also have been the most important subsistence commodity for the townsfolk of Kaupang, and since many of their transactions would have been a matter of obtaining food, it is reasonable to postulate that grain was the most common type of commodity-money for transactions amongst the townsfolk and in their trade with the population of the agrarian hinterland.

10.2 Production and long-distance trade AD 700–1000

The intense flourishing of specialized sites for craft and trade seen in Scandinavia from around the year 700 has to be explained partly in terms of social, political and economic changes within Scandinavia and partly on the basis of the opportunities for long-distance trade that the circumstances offered: namely along the Slavonic Baltic coast and the Carolingian and Anglo-Saxon North Sea coasts. The growing trade between the Carolingian and Anglo-Saxon ports in the 7th century enabled the Scandinavians to gain access to long-distance trade goods through trade in the ports, whereas previously they had to be obtained through personal connexions with aristocratic families in those other lands.

It is striking that it was probably the emergent Scandinavian royal power, not the old aristocracy that created the fora for long-distance trade by founding the nodal markets, as it definitely did through the foundation of the towns. Likewise, the old aristocracy does not appear to have been so closely linked to the local markets. The motives of the royal power in founding these sites probably had to do with, as in the Anglo-Saxon kingdoms, obtaining income from tolls on long-distance trade and enforcing the king's right of pre-emption regarding particular goods, as well as strengthening the kingdom in general (Middleton 2005). Apart from those incomes, the king himself need not have been a central agent in the trade, even though he, like all major landowners, would also have ensured that his surplus production was taken to market.

The remainder of the aristocracy must, however, have played a crucial role in *taking advantage* of the opportunities that were offered in these new fora for long-distance trade. In several parts of Scandinavia structural changes in agriculture can be traced which must have been directed at increasing productivity. They too are of a character that must have been initiated by major landowners. In the case of Southern Norway, Bjørn Myhre (2002:181–202) has observed a concentration of settlement that is associable with the introduction of more effective methods of farming, while agricultural equipment became more efficient at the same time and the farms themselves larger. These changes took place in the course of the 7th and 8th centuries, at different dates in different regions. In Jutland the intensification and re-organization of agricultural production can be seen around AD 700, with a clear aim of producing surpluses (Näsman 2000:60–2).

With the scope they had for controlling agricultural production, the major landowners laid the essential foundation for the boom that is evident in trade and craft in the 8th century: the production of an agricultural surplus that could keep traders, craftsmen and various other producers fed. Some such surplus must have been in existence for independent craftsmen in towns and nodal markets to have been able to obtain it in exchange (Callmer 2002). The surplus production of food was also essential for the landowners themselves to be able to remove persons from food production and put them to the specialized production of goods that would be in demand in trade within both intra- and inter-regional networks, as well as in long-distance trade.

It is likely that the goods produced with a view to their marketing at sites of Types 1–4 (Skre, this vol. Ch. 9:337–8, Fig. 9.1) would largely have consisted of various forms of essential items produced by specialists using local resources such as iron, furs, amber and cloth. In addition, many craftsmen would have sold their products to fellow Scandinavians at local and nodal markets. At nodal markets and in towns, long-distance traders would have bought those goods they were interested in, and transported them into the Continental and Insular trading networks. They might have been especially interested in one form of goods that, according to McCormic (2001) was one of the most fundamental in the European economy of this period, namely slaves. Slave-taking might have been a crucial motive for the Scandinavian expansion into the Slavonic areas in the 8th century and into Ireland in the 9th. Slave-raiding has to be regarded as one of the forms of specialized production organized by the Scandinavian aristocracy in this period.

What, though, would have been the desirable goods that brought traders from afar all the way north to Vestfold, and which the landlords of 8th- and 9th-century Norway opted to set their people to produce? The export items that could have been produced in some quantities from parts of Norway in the Viking Period are commodities such as soapstone, whetstones, furs, iron, wool and slaves. Finds from Ribe and Dorestad show that only small amounts of soapstone arrived there in the first half of the 9th century (Baug, in prep.). However it is a matter of interest that soapstone, probably from somewhere in Norway, first appears in the Posthus excavations in Ribe in contexts datable to the period 800–820 (2 pieces), and in larger quantities (22 pieces) in the later contexts (820–850). Soapstone thus first appears in the years immediately following the foundation of Kaupang. Whetstones of dark violet slate, probably from the west of Norway, were introduced at the same time, but whetstones of the Eidsborg type do not occur in the Viking-period layers of Ribe (Feveile and Jensen 2000:20, fig. 11).

The finds from Hedeby are not so easy to date because the archaeological layers revealed by excavation there are less secure and less well dated than those in Ribe. All the same, the finds indicate that soapstone appeared there in large quantities only in the second half of the 9th century, and perhaps did so particularly in the 10th century (Resi 1979:111–12). It would appear, however, that whetstones occur there from the very earliest layers, both the dark variety from Western Norway and the light type from Eidsborg in Telemark (Resi 1990:44–7).

Studies of the evidence of iron production in Norway have been carried out over many years; the two periods that stand out with the highest output are the periods before c. AD 600 and after c. AD 1000. Evidence of Viking-period production has been sparse in many areas, and often difficult to identify. Larsen (2004:160–2) notes a number of possible explanations, of a methodological nature, that could mean that the number of production-site finds are unrepresentative of iron production in this period. If his figures are divided up regionally, there are, however, some interesting differences. In Eastern Norway, namely the inland regions north and west of Kaupang, the number of iron-extraction sites doubled around AD 600, to a level that was maintained, with some variation, throughout the Viking Period (Larsen 2004:fig. 5). There was thus probably surplus production of iron both before and throughout the history of Kaupang.

Other types of goods, such as furs and slaves, are difficult to trace archaeologically. No paw bones of fur-bearing animals have been found at Kaupang whereas they have been found at Birka (Wigh 2001:120–3). But this cannot be used as evidence that there was no fur trade at Kaupang. At Birka the removal of the paws from the furs was manifestly part of the production sequence there. It is conceivable that the sequence in Kaupang was organized differently; moreover, the conditions for the preservation of bones, especially small bones, are much poorer in the acid soil in Kaupang (Barrett et al. 2007:293). As noted, McCormic (2001) identifies slaves as the most important export from Europe in trade with the Orient in this period, and he believes that Scandinavia provided slaves for this trade. Kaupang might have played a role in the slave trade, but it is difficult to find any supporting evidence for this in the archaeological remains.

It is equally difficult, in fact, to produce firm archaeological evidence that the more durable types of materials such as iron, soapstone and whetstones were actually traded through Kaupang. Finds from the settlement area show that all of these types of materials did reach Kaupang for the use of its inhabitants. But it is difficult, in the archaeological finds, to see if they were also brought into the town in order to be re-exported by long-distance traders. However the very idea of founding a town on the border of a kingdom implies that the site should serve, *inter alia,* as a toll station for the king (Middleton 2005). Goods that were brought into the kingdom from the lands of the Northmen must necessarily have been subject to toll at Kaupang. When, around 890, Ohthere sailed from North Norway along the Northmen's coasts and into the territory of the King of the Danes, he called at Kaupang before continuing his voyage to Hedeby. One of the purposes of his vist to Kaupang might have been to pay the tolls on his cargo.

Things would have been different concerning those goods produced within the kingdom. Soapstone was used in the Viking Period in Østfold, Halland and Bohuslän – all areas within the Danish kingdom. Geological studies of soapstone from Hedeby indicate that it came from only these areas (Alfsen and Christie 1979; Baug, in prep.); there is little reason why it should have been brought into Kaupang before being transported to Hedeby. However the great whetstone quarries at Eidsborg in Telemark and in the west of Norway appear to have lain outside the Danish king's territory. When production and exportation from these quarries accelerated through the 9th century, the goods would then presumably have been subjected to toll at Kaupang before they continued on to Hedeby and to other destinations in the kingdom. More uncertain is what happened to Kaupang's role as a toll station after the Danish kingdom split up from the mid-9th century down to the reign of Gorm the Old some 70–80 years later. As already noted, for parts of this period Hedeby was part of the German kingdom. Kaupang's political allegiance is unclear. It would appear most likely that the old petty-king dynasty of Vestfold, the Ynglings, re-established their control over the town (Skre 2007j:466–7).

Although tradition determined fixed prices for intra- and inter-regional trade in the subsistence goods and essentials such as iron, whetstones and soapstone vessels that would have been attractive to long-distance traders, it is not certain that they would have been ready to pay those prices. Tradition did not determine the prices of the long-distance trade goods they imported. Both of these conditions would have created an opportunity for economic agency, not only for the long-distance traders but also for others participating in this trade.

During the first half-century of Kaupang, payment with hacksilver was principally focused, within South-Western Scandinavia, upon the towns of Hedeby and Kaupang, and to some extent at other specialized sites of craft and trade. To judge from the actual finds of silver outside of Kaupang, hacksilver was very little seen or used in rural Norway in the 9th century. This indicates that in the 9th century it was primarily the inhabitants of Kaupang who used silver as a currency in trade amongst themselves and with long-distance traders. The trade that the landlords and producers were involved in, some of which went on at Kaupang too, was probably principally conducted using goods as currency. It is not before the 10th century that greater quantities of hacksilver start to appear in hoards in rural areas in the vicinity of towns. The amounts increase over the course of the century, but in the parts of Scandinavia that lie far from towns, such as the west and north of Norway, hacksilver seems still to have been little used (Hårdh, this vol. Ch. 5:99). In those areas, whole silver artefacts are predominant in the hoards. The appearance of weight-adjusted silver objects all over Scandinavia shows that although the use of silver as a currency had only a limited and a slowly changing range, the metal nevertheless became established as the most common measure of value in Scandinavia across the 9th and 10th centuries.

It must be correct to regard the economic life of the towns as the driving force behind the development of silver as a currency and measure of value. In regions with no towns and few if any market sites, silver did not become a common form of currency until towns were founded there in the 11th and 12th centuries.

The transformative significance of the early towns regarding the economies of the Scandinavian societies was not, however, just a matter of currencies and measures of value. It lay rather in the opportunity that the loose social networks in the towns, created by long-distance trade and the urban way of life, provided for the growth of economic agency.

Abbreviations

Ab	*Aarsberetning. Foreningen til norske fortidsminnesmerkers bevaring.* Kristiania.
AD	Anno Domini (Christian era)
B	Finds kept at Bergen Museum, University of Bergen
C	Finds kept at Museum of Cultural History (KHM), University of Oslo
CNS	*Corpus Nummorum Saeculorum IX–XI qui in Suecia reperti sunt. Catalogue of Coins from 9th–11th Centuries found in Sweden.* Kungliga vitterhets-, historie- och antikvitetsakademien. Stockholm, 1975–.
CRM	Cultural resource management excavations (c.f. Pilø and Skre, this vol. Ch. 2:20)
fnr.	find number, Blindheim's excavations 1950–1984
H	Hijra (Muslim era)
KHM	Museum of Cultural History, University of Oslo
LRBC	Carson, R. A. G., Hill, P. V., and Kent, J. 1960: *Late Roman Bronze Coinage A.D. 324-498.* London.
LUHM	Finds kept at Lund University Historical Museum
m-d	metal-detector
MRE	Main research excavation (c.f. Pilø and Skre, this vol. Ch. 2:20)
NFG	Numismatiska Forskningsgruppen (Stockholm Numismatic Institute), Institute of Classical Archaeology and Ancient History, Stockholm University
NM	Finds kept at The National Museum of Denmark, København
obv.	obverse
rev.	reverse
RIC	*Roman Imperial Coinage,* eds.: H. Mattingly, E. A. Sydenham, and others. 10 vols. London, 1923–94.
SHM	Finds kept at Statens Historiska Museum, Stockholm
SP	Site Period (c.f. Pilø and Skre, this vol. Ch. 2:22–4)
St	Finds kept at Archaeological Museum in Stavanger (AmS).
T	Finds kept at Vitenskapsmuseet, The Norwegian University of Science and Technology (NTNU), Trondheim
t.p.q.	terminus post quem

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OBS: ** Icelanders are listed by their family name*

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